



## Workshop Manual Fox 2004 ➤

### Heating, air conditioning

Edition 09.2011





## List of Workshop Manual Repair Groups

### Repair Group

- 80 - Heating
- 87 - Air conditioning system

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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## 80 – Heating

### 1 Heating - passenger compartment components

(ELSA-Converter; Edition 09.2011)



#### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- = Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



#### Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.*
- ◆ *When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.*



## 1 - Side air baffles with frame

- With integrated air baffle flaps for side windows.
- Remove and install  
[⇒ page 10](#)

## 2 - Demisting baffle

- Removal only with the instrument panel removed ⇒ Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation

## 3 - Air baffles (central)

- Remove and install  
[⇒ page 11](#)

## 4 - Ventilation adjustment mechanism

- Remove and install  
[⇒ page 15](#)

## 5 - Ventilation adjustment mechanism (Europe vehicles only)

- Remove and install  
[⇒ page 16](#)

## 6 - Defogger nozzle

- Remove and install  
[⇒ page 13](#)

## 7 - Air duct

- For the right air baffle on the panel ⇒ Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation

## 8 - Air duct

- For the left air baffle on the panel ⇒ Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation

## 9 - Air distributor for baffles

- Remove and install [⇒ page 13](#)

## 10 - Dust and pollen filter compartment (Denso Box)

## 11 - Air intake duct (Denso Box)

## 12 - Opening motor of the air intake small door (Denso Box) - vehicles with air conditioning only

## 13 - Natural air fan -V2- (Denso Box)

- Remove and install [⇒ page 6](#)

## 14 - Natural air fan pre-resistance with overheating fuse -N24- (Denso Box)

- Remove and install (Denso box) [⇒ page 8](#)

## 15 - Heat exchanger compartment (Denso Box)

## 16 - Natural air fan -V2- (Behr box)

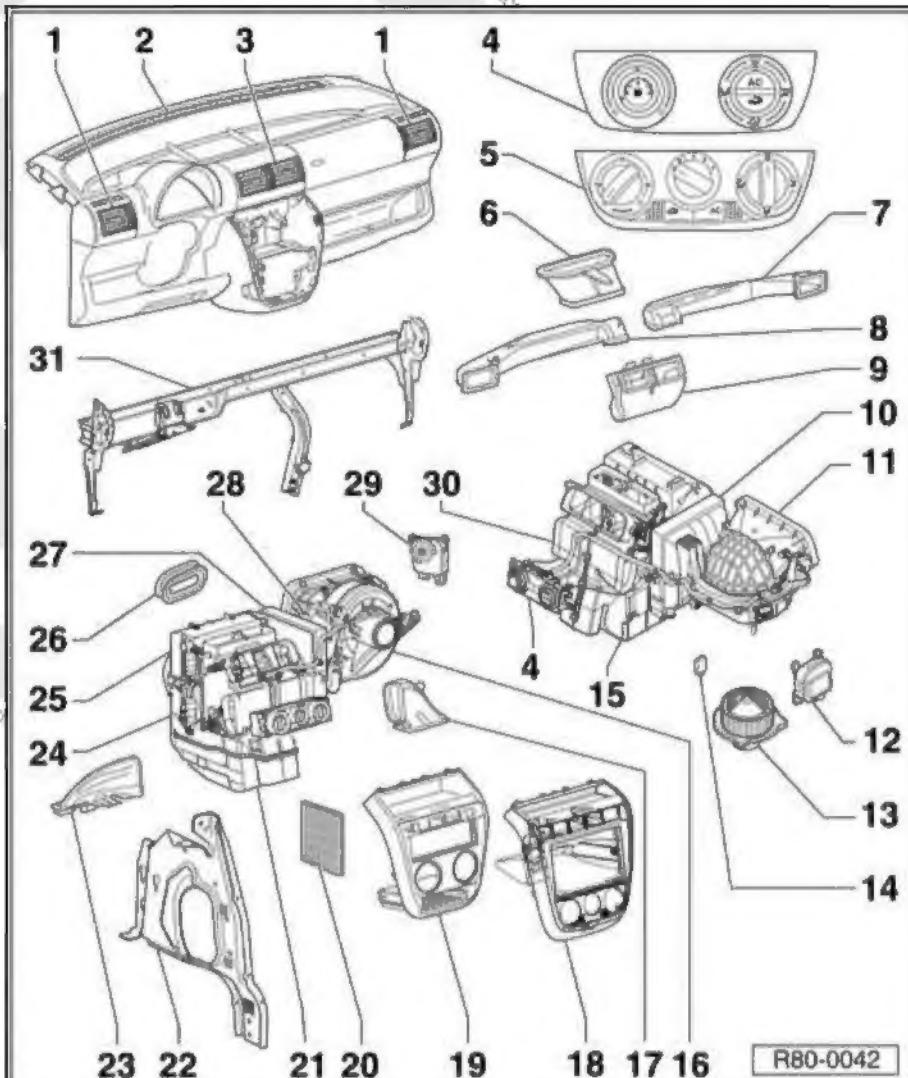
- Remove and install [⇒ page 5](#)

## 17 - Front right feet air duct

- Remove and install [⇒ page 12](#)

## 18 - Lower central frame (Europe vehicles only)

- Remove and install ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations





19 - Lower central frame

- Remove and install ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations

20 - Dust and pollen filter

- Remove and install (Behr Box) ⇒ [page 8](#)
- Remove and install (Denso box) ⇒ [page 9](#)

21 - Heat exchanger compartment (Behr box)

22 - Left mounting of transverse support

- Remove and install ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations

23 - Front left foot air duct

- Remove and install ⇒ [page 12](#)

24 - Plenum chamber (Behr Box)

- Remove and install ⇒ [page 21](#)

25 - Evaporator compartment (Behr Box)

- For air-conditioning system

26 - Sealing

- Note installation position ⇒ [page 4](#)
- Replace if damaged

27 - Dust and pollen filter compartment (Behr Box)

28 - Natural air fan pre-resistance with overheating fuse -N24- (Behr Box)

- Remove and install ⇒ [page 7](#)

29 - Opening motor of the air intake small door (Behr Box) - vehicles with air conditioning only

- Remove and install ⇒ [page 31](#)

30 - Plenum chamber (Denso Box)

- Remove and install ⇒ [page 24](#)

31 - Cross member

- Remove and install ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations

## 1.1 Heat exchanger/engine compartment partition panel sealing

For vehicles equipped with a ventilation / heating system.

- ◆ Vehicles with air conditioning system ⇒ [page 64](#) .



1 - Plenum chamber

2 - Heat exchanger intake duct

- Heat exchanger - remove and install  
[⇒ page 45](#)

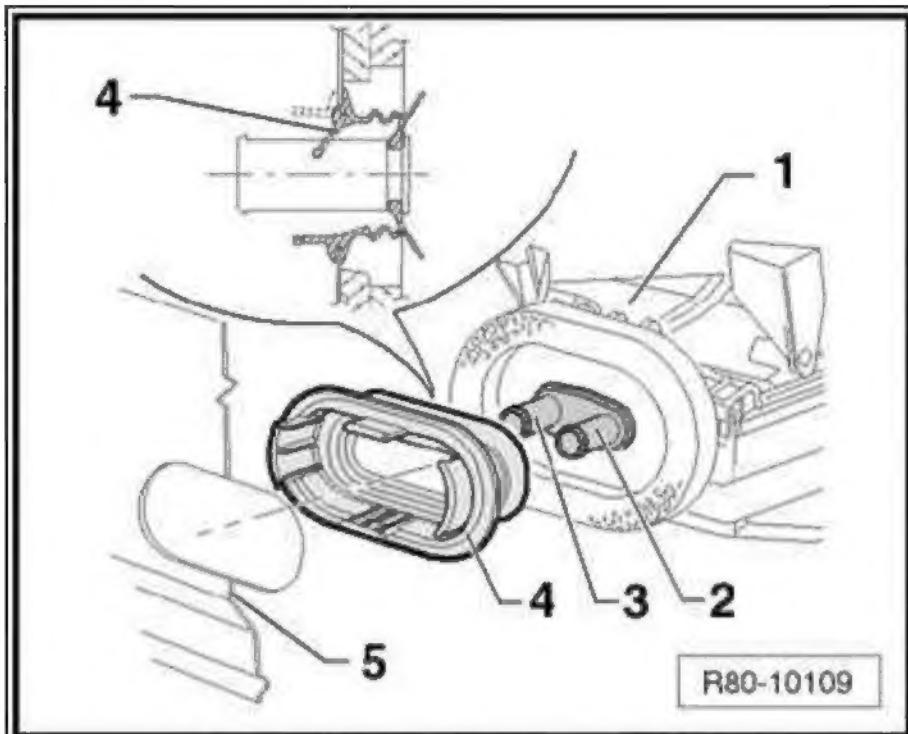
3 - Heat exchanger outlet duct

- Heat exchanger - remove and install  
[⇒ page 45](#)

4 - Heat exchanger sealing

- Replace if damaged

5 - Engine compartment's partition panel

**WARNING**

*Observe correct installation of intake and outlet coolant hoses in the heat exchanger.*

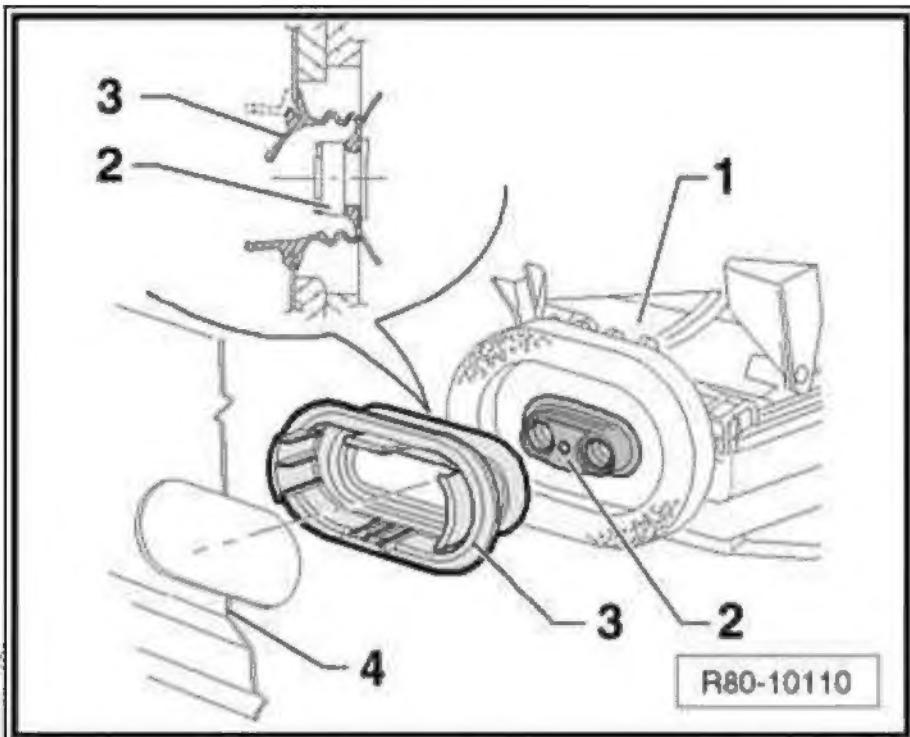
## 1.2 Heat exchanger / engine compartment partition panel sealing (Europe vehicles only)

For vehicles equipped with a ventilation / heating system.

- ◆ Vehicles with Air Conditioning system (Europe vehicles only)  
[⇒ page 65](#).



- 1 - Plenum chamber
- 2 - Heat exchanger
  - Remove and install  
⇒ [page 45](#)
- 3 - Heat exchanger sealing
  - Replace if damaged.
- 4 - Engine compartment's partition panel



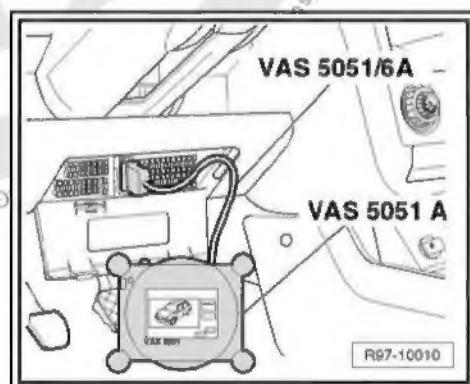
#### WARNING

Observe correct installation of intake and outlet coolant hoses in the heat exchanger.

### 1.3 Natural air fan -V2-

#### 1.3.1 Natural air fan -V2- - check

- Connect Diagnosis, measurement and information system - VAS 5051A- or later equipment ➤ General Information; Rep. gr. 97 ; Electric cables and harnesses .
- Proceed by selecting the desired functions ⇒ Vehicle diagnostic tester.



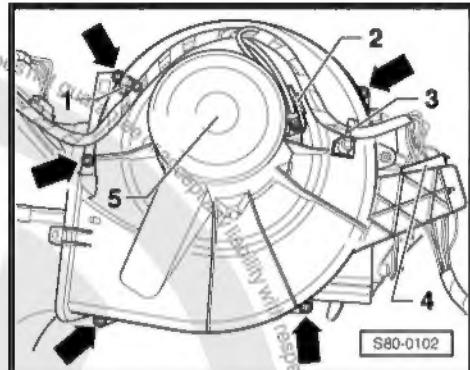
#### 1.3.2 Natural air fan -V2- (Behr box) - remove and install

For vehicles with Behr plenum chamber.

- ♦ Vehicles with Denso plenum chamber ⇒ [page 6](#) .

**Removal:**

- Remove the glove compartment (European vehicles only) ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings/insulation .
- Disconnect connector -2- from the fan.
- Carefully cut cable fastening -1- and -3- .
- Disengage connector -4- from fan case -5- .
- Remove the fastening screws -arrows- and remove fan case.

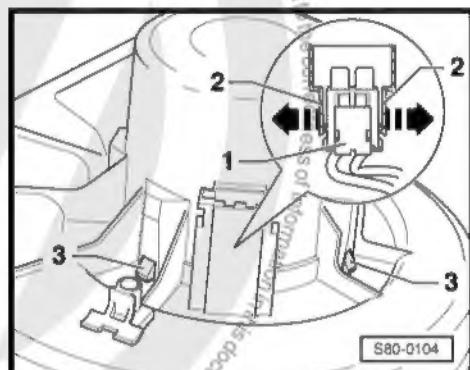


- By using a small screwdriver, release carefully the locks -2- from the connector towards the arrow, and push connector -1- downwards.
- Press locks -3- with a screwdriver inwards and downwards.
- Remove the Natural air fan -V2- from fan case.

**Installation:**

Installation is performed in reverse sequence to the removal, observing the following:

- The Natural air fan -V2- is different for the heater and air conditioning equipment - check the part number.
- The connector shall be connected correctly.
- Tighten fastening screws to a torque of (1 Nm).
- Locks -3- must leave completely the fan case.
- Check fan operation before installing fan case [page 5](#) .



### 1.3.3 Natural air fan -V2- (Denso Box) - remove and install

For vehicles with Denso plenum chamber.

- Vehicles with Behr plenum chamber [page 5](#) .

**Removal:**

- Disconnect fan connector.

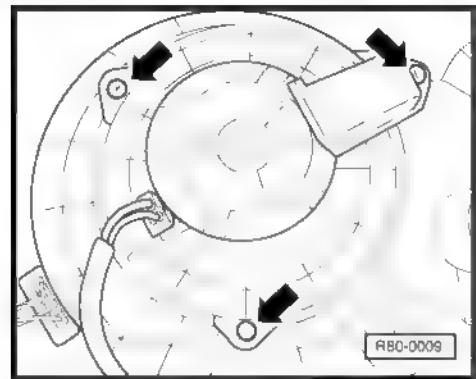


- Remove fastening screws -arrows- and remove the Natural air fan -V2- from fan case.

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- The Natural air fan -V2- is different for the heater and air conditioning equipment - check the part number.
- The connector shall be connected correctly.
- Tighten fastening screws to a torque of (1 Nm).
- Check fan operation before installing fan case [⇒ page 5](#).



### 1.4 Natural air fan pre-resistance with over-heating cut-out -N24- - remove and install

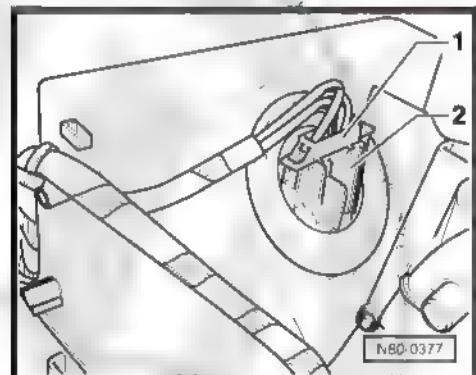
#### 1.4.1 Natural air fan pre-resistance with over-heating cut-out -N24- - remove and install

For vehicles with Behr plenum chamber.

- Vehicles with Denso plenum chamber [⇒ page 8](#).

#### Removal:

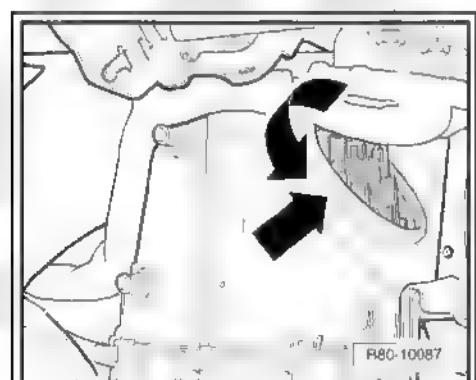
- Remove the glove compartment (European vehicles only) ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings/insulation .
- Disengage connector -1- from Fresh air fan pre-resistance with overheating cut-out -N24- -2-.



- Turn the Natural air fan pre-resistance with overheating cut-out -N24- counterclockwise, and remove it upwards.

#### Installation:

Installation is performed in reverse sequence to the removal.





## 1.4.2 Natural air fan pre-resistance with over-heating fuse -N24- (Denso box) - remove and install

For vehicles with Denso plenum chamber.

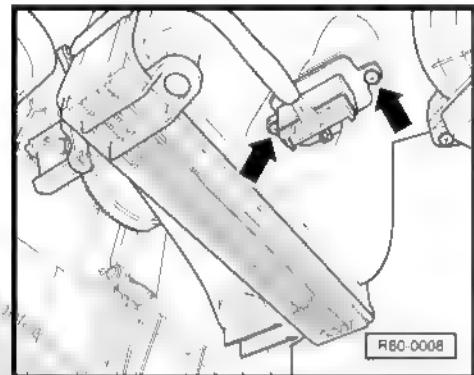
- ◆ Vehicles with Behr plenum chamber [⇒ page 7](#).

Removal:

- Disengage the connector.
- Loosen fastening screws -arrows- and remove the Fresh air fan pre-resistor with overheating fuse -N24-.

Installation:

Installation is performed in reverse sequence to the removal.



## 1.5 Dust and pollen filter - remove and install

### 1.5.1 Dust and pollen filter (Behr box) - remove and install

For vehicles with Behr plenum chamber with dust and pollen filter.

- ◆ Vehicles with Denso plenum chamber [⇒ page 9](#).

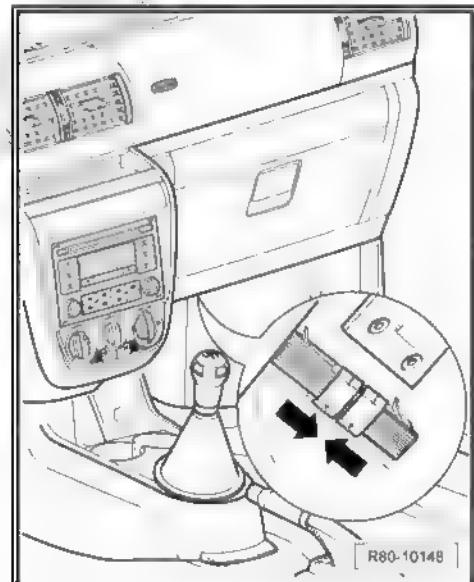


Note:

*The dust and pollen filter is located on the lower right side, under the dash panel.*

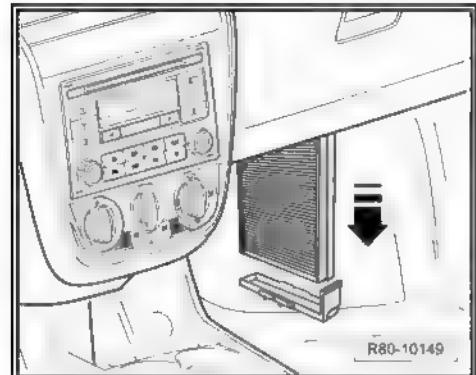
Removal:

- Join the dust and pollen filter cover locks -arrows-.





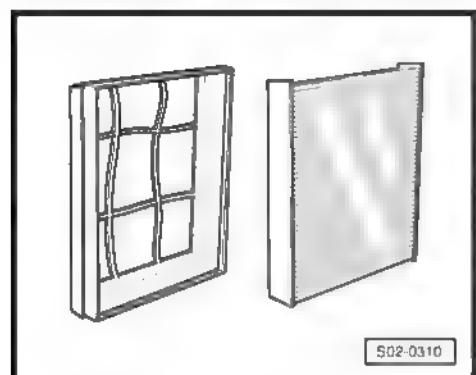
- Remove dust and pollen filter from the ventilation case  
-arrow-



- Remove the filtering element from framework.

**Installation:**

Installation is performed in reverse sequence to the removal.



### 1.5.2 Dust and pollen filter (Denso Box) - remove and install

For vehicles with Denso plenum chamber with dust and pollen filter.

- ◆ Vehicles with Behr plenum chamber [⇒ page 8](#).

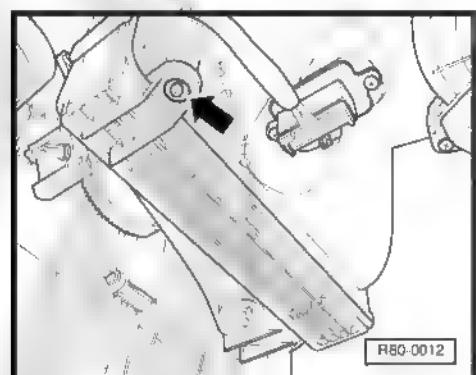


#### Note

*The dust and pollen filter is located on the lower right side, under the dash panel.*

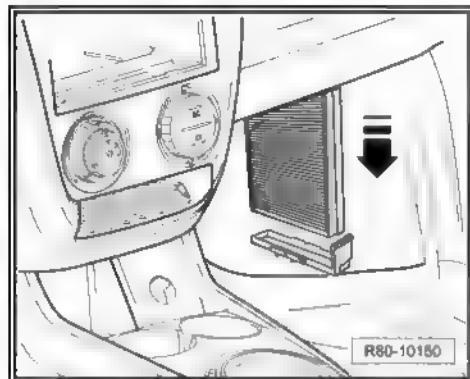
**Removal:**

- Remove fastening screw -arrow- from the dust and pollen filter cover.





- Remove dust and pollen filter -arrow-.

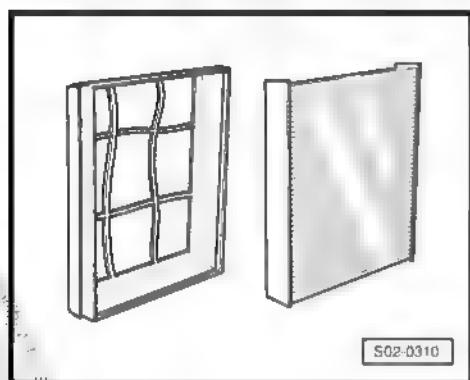


- Remove the filtering element from framework.

**Installation:**

Installation is performed in reverse sequence to the removal, observing the following:

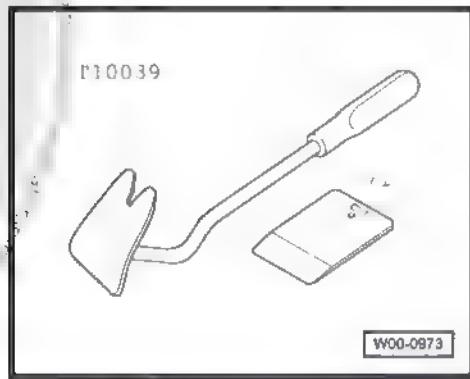
- Check the filtering element installing position on framework.



## 1.6 Air vents - remove and install

Special tools and workshop equipment required

- ◆ Lever -T10039-



### 1.6.1 Air baffles (sides) - remove and install



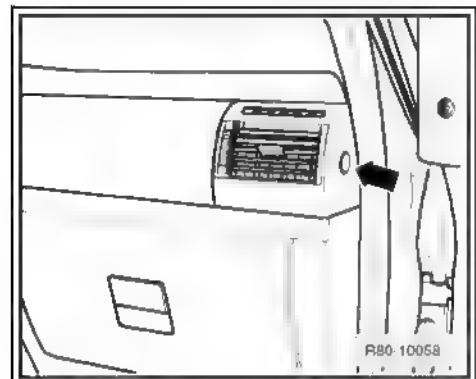
**Note**

*Side air baffles on both sides are removed in a similar manner*

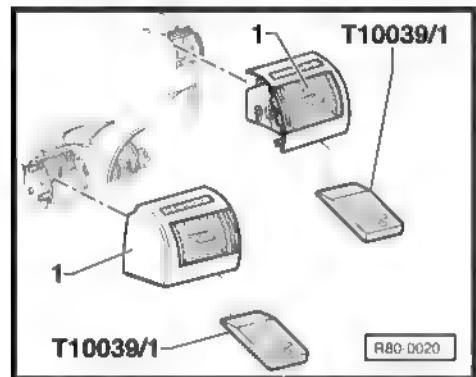


**Removal:**

- Remove fastening clip from baffles side.



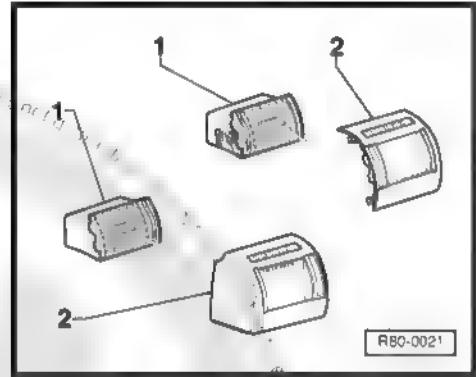
- Using the Lever -T10039- , disengage and remove the baffles together with the frame.



- Slightly press the locks on back of frame -2- and separate baffle -1- toward back.

**Installation:**

Installation is performed in reverse sequence to the removal.



## 1.6.2 Air baffle (central) - remove and install

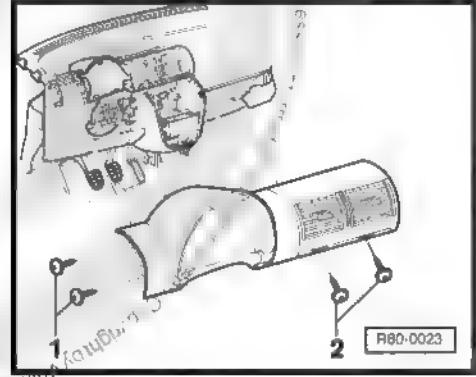
**Removal:**

- Remove left side air baffle [page 10](#).
- Remove the screws -1-.
- Remove the instrument panel's lower central frame ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings/insulations
- Remove the screws -2-.
- Remove central air baffle together with frame.
- Slightly press locks on the rear side of the frame and separate the baffle toward back

**Installation:**

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten fastening screws - 1 and 2- to a torque of 1.5 Nm.





## 1.7 Footwell vent - remove and install

### 1.7.1 Footwell air duct (front left) - remove and install



#### Note

The footwell vent (front left) is located in the lower left side of the dash panel, near the brake and accelerator pedals.

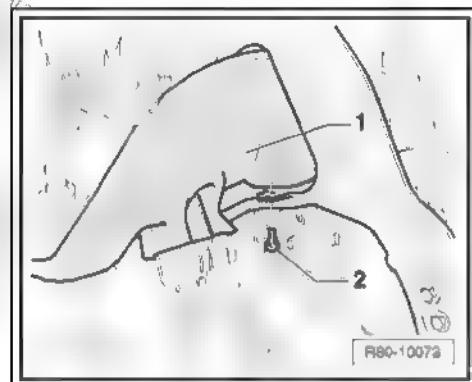
#### Removal:

- Remove the fastening screw -2- for the air duct.
- Remove air duct -1-.

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten fastening screw -2- to torque (1.5 Nm).



### 1.7.2 Feet air duct (front right) - remove and install



#### Note

The footwell vent (front right) is located on the lower right side of the dash panel, behind the glove box.

#### Removal:

##### Continuation for Europe vehicles:

- Remove glove compartment (Europe vehicles only) ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .

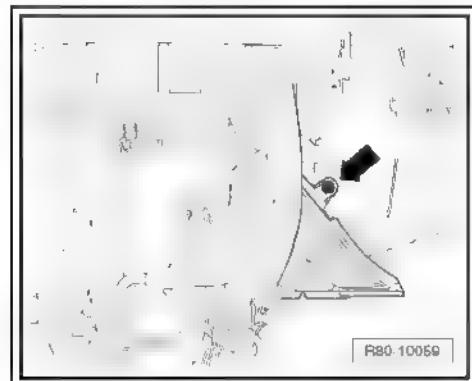
##### Continuation for other vehicles:

- Remove tray on the passenger side (instrument panel without glove compartment) ⇒ Body - Internal assembly works; Rep. gr. 68 ; Internal equipment .
- Remove the screw -arrow-.
- Remove feet air duct.

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten the fastening screw -arrow- with (1.5 Nm) of torque

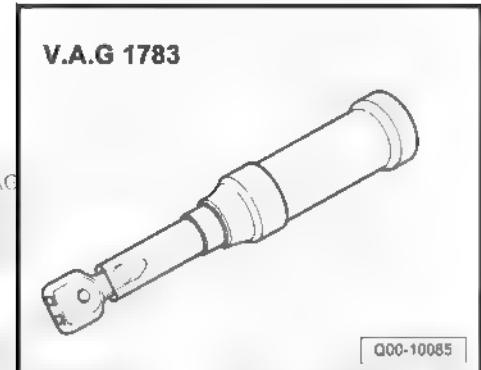




## 1.8 Demister nozzle and air distributor for central baffles - remove and install

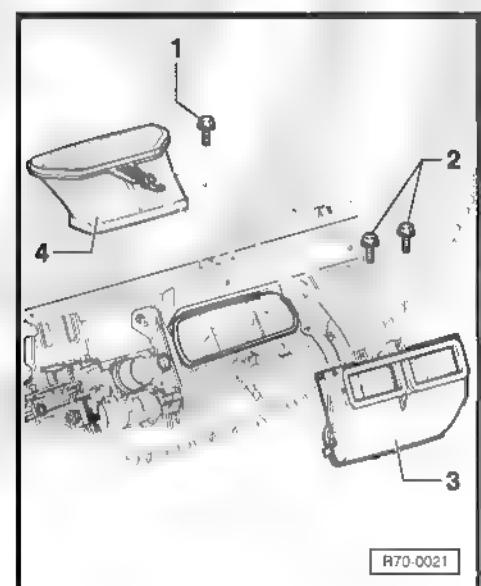
Special tools and workshop equipment required

- ◆ Torque wrench 2 to 10 Nm -VAG 1783-



### 1.8.1 Removal

- Remove the dash panel ⇒ Body -internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove air ducts to the side baffles, by simply disengaging them from the baffles air distributor -3-.
- Remove screws -1 and 2-.
- Remove demister nozzle -4- and baffles air distributor -3-.

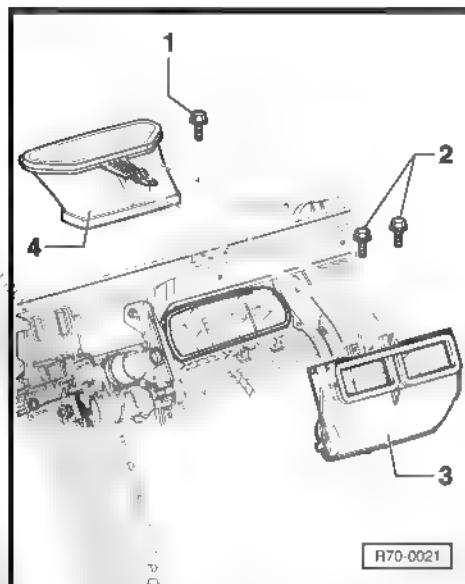


### 1.8.2 Installation

Installation is performed in reverse sequence to the removal, observing the following



- Tighten fastening screws - 1 and 2- to a torque of 6.5 Nm



## 1.9 Exhaust valve - remove and install

Saturated air leaves exhaust valve openings -2- located on the rear panel, under the bumper.

For the ventilation system to work perfectly, these exhaust openings must not be clogged.

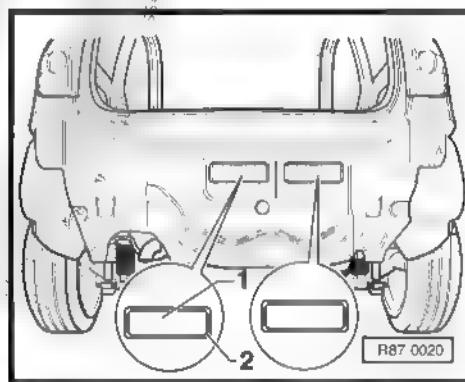
Exhaust openings have a cover -1- which opens and closes automatically.

- Check operation of exhaust opening covers, and replace them as required.



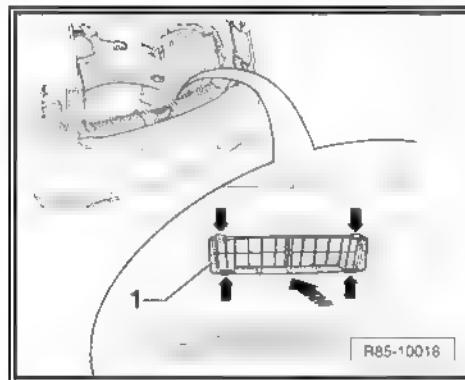
### Note

*To remove exhaust valves, do not remove rear bumper.*



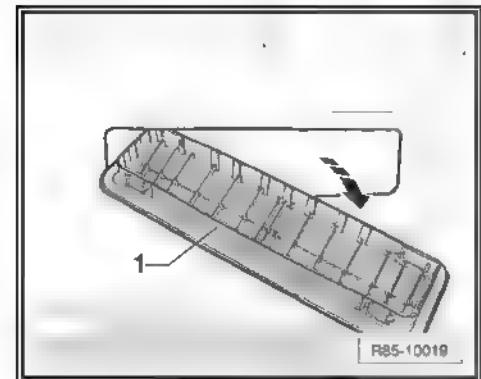
### 1.9.1 Removal

- Remove the lower cover of the rear panel ⇒ Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation .
- Press locks -arrows- and carefully move the exhaust valve -1- in direction of the -arrow-.





- Move the exhaust valve -1- in the direction of the -arrow- and remove it from the luggage compartment side



## 1.9.2 Installation

Installation is performed in reverse sequence to the removal.

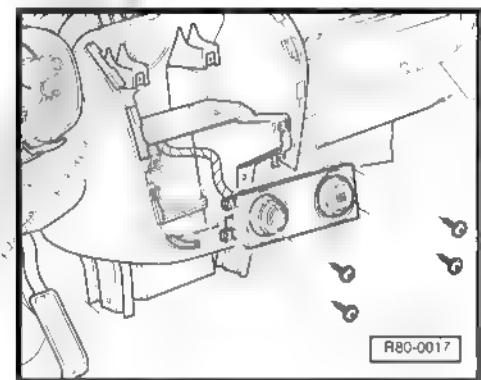
## 1.10 Ventilation adjustment mechanisms

### 1.10.1 Ventilation adjustment mechanism - remove and install

Ventilation adjustment mechanism, heating and air conditioning.

Removal:

- Remove the radio from the dash panel ⇒ Communication; Rep. gr. 91 ; Radio, telephone, navigation system .
- Remove the lower centre frame ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation
- Remove ventilation adjustment mechanism securing bolts.





- Disengage command cables -1- from ventilation and heating adjustment mechanism -2-.
- Disconnect connectors.
- Remove ventilation adjustment mechanism -2-.

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten fastening screws of ventilation adjustment mechanism to specified (1.5-Nm) torque.



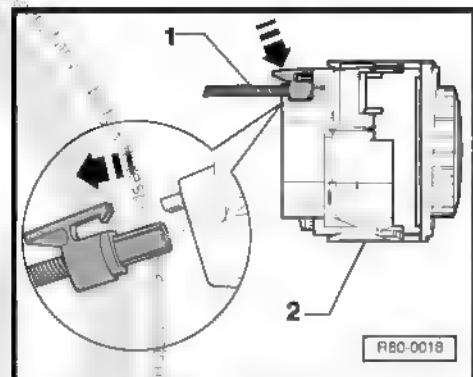
*When installing command cables in the ventilation adjustment mechanism, observe thoroughly the following installation orders for individual cables:*

#### Temperature command cable:

- Turn temperature adjustment command cable all the way to the right, adjust command button for temperature adjustment all the way to the left and connect the cable.

#### Air distribution command cable:

- Position the air distribution command button to the demister and with the air ventilation on, turn the command cable until full ventilation to the demister (windscreen) is obtained and then connect it.

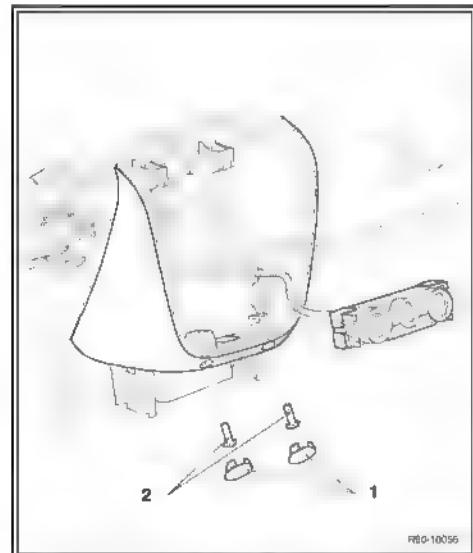


## 1.10.2 Ventilation adjustment mechanism (Europe vehicles) - remove and install

Ventilation adjustment mechanism, heating and air conditioning.

#### Removal:

- Remove the radio from the dash panel => Communication; Rep. gr. 91 ; Radio, telephone, navigation system .
- Remove the lower centre frame => Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation
- Remove coverings -1- and screws -2-.



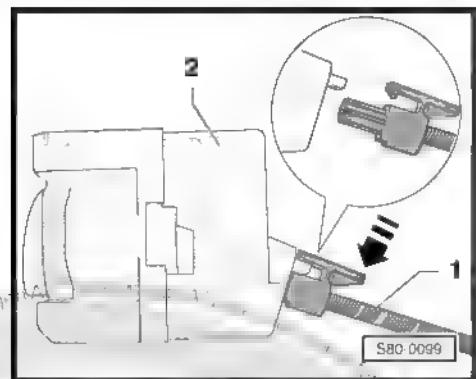


- Disengage command cable -1- from ventilation and heating adjustment mechanism -2-.
- Disconnect connectors.
- Remove ventilation adjustment mechanism -2-.

**Installation:**

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten fastening screws of ventilation adjustment mechanism to specified (1.5-Nm) torque.



*When installing command cables in the ventilation adjustment mechanism, observe thoroughly the following installation orders for individual cables:*

**Temperature command cable:**

- Turn temperature adjustment command cable all the way to the right, adjust command button for temperature adjustment all the way to the left, and connect the cable.

**Air distribution command cable:**

- Position the air distribution command button to the demister and with the air ventilation on, turn the command cable until full ventilation to the demister (windscreen) is obtained and then connect it.

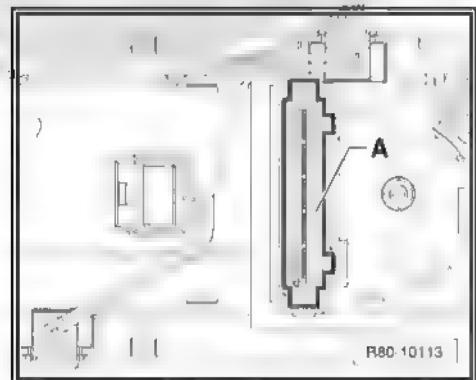
### 1.10.3 Ventilation / heating adjustment mechanism power connectors

For vehicles equipped with a heating system.

- ◆ Vehicles with air conditioning system ⇒ [page 57](#)

Position of the multiple connector (A) on rear of the ventilation adjustment mechanism:

- A- Housing for 5-pole supply connector.
- 1- Ventilation level 4.
- 2- Ventilation level 3.
- 3- Ventilation level 2.
- 4- Ventilation level 1.
- 5- Terminal -X- contact.



*Connector pins in the ventilation / heating adjustment mechanisms can also be found in the electrical diagrams ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*



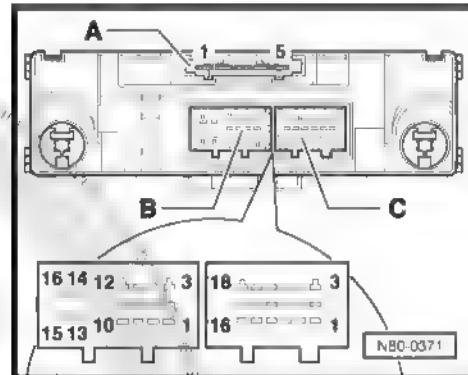
#### 1.10.4 Ventilation / heating adjustment mechanism power connectors (Europe vehicles only)

For vehicles equipped with a heating system.

- ◆ Vehicles with air conditioning system [page 58](#).

Position of multiple connectors (A and B) on rear area of the ventilation adjustment mechanism:

- A- Housing for 5-pole supply connector.
- 1- Ventilation level 4.
- 2- Ventilation level 3.
- 3- Ventilation level 2.
- 4- Ventilation level 1.
- 5- Terminal X- contact.
- B- Housing for 16-pole supply connector.
- 9- Additional heating resistance -Z35- .
- 12- Control motor for fresh air valve and recirculation valve - V154- .
- 13- Terminal 31.
- 14- Terminal 15.
- 16- Terminal 58d.



##### Note

Connector pins in the ventilation adjustment mechanisms can also be found in the electrical diagrams [Current flow diagrams](#), [Electrical fault finding](#) and [Fitting locations](#).

### 1.11 Command cables - remove and install

#### 1.11.1 Command cables (heating and air conditioning system) - remove and install

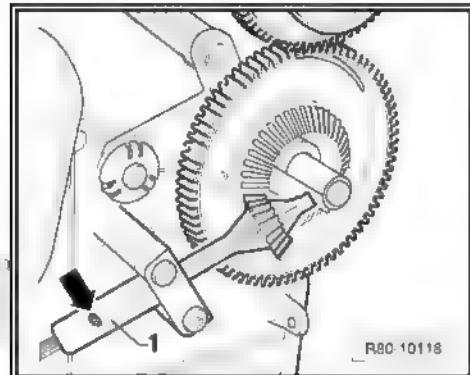
For vehicles with a heating / air conditioning system:

Removal:

- Remove the Radio -R- or "CD player" -R89- from the instrument panel  $\Rightarrow$  Communication; Rep. gr. 91 ; Radio, telephone, navigation system .
- Remove the lower centre frame  $\Rightarrow$  Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation
- Remove ventilation adjustment mechanism [page 15](#) .



- Press slotting lock with a screwdriver -arrow- and remove the air distribution command cable -1-



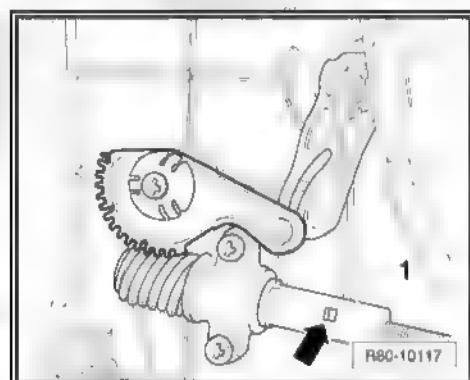
- Press the slotting lock with a screwdriver -arrow- and remove the temperature adjustment command cable -1-.

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:



*When installing command cables in the ventilation adjustment mechanism, observe thoroughly the following installation orders for individual cables:*



#### Temperature command cable:

- Turn temperature adjustment command cable all the way to the right, adjust command button for temperature adjustment all the way to the left, and connect the cable.

#### Air distribution command cable:

- Position the air distribution command button to the demister and with the air ventilation on, turn the command cable until full ventilation to the demister (windscreen) is obtained and then connect it.

#### Checking ventilation system operation:

The ventilation adjustment mechanism command cable is correctly installed when in the "Defrost" or windscreens demist position, no air leaves the footwell vents .

If this does not occur, turn the drive button by half-turn (180°) and reinstall the control cable.

## 1.11.2 Command cables (ventilation system) - remove and install

For vehicles equipped with ventilation system.

#### Removal:

- Remove the Radio -R- or "CD player" -R89- from the instrument panel ⇒ Communication; Rep. gr. 91 ; Radio, telephone, navigation system .
- Remove the centre frame of the dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Linings/insulations .
- Remove ventilation adjustment mechanism [page 15](#) .



– Press slotting lock with a screwdriver -arrow- and remove the air distribution command cable -1-

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following.



#### Note

*When installing command cables in the ventilation adjustment mechanism, observe thoroughly the following installation orders for individual cables:*

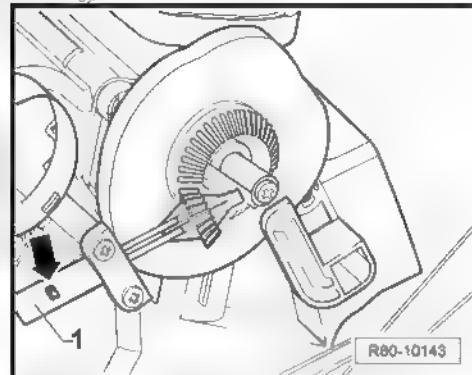
#### Air distribution command cable:

– Position the air distribution command button to the demister and with the air ventilation on, turn the command cable until full ventilation to the demister (windscreen) is obtained and then connect it.

#### Checking ventilation system operation:

Ventilation adjustment mechanism command cable is correctly installed when, in the windscreen position, no air leaves the foot-well air ducts.

If this does not occur, turn the drive button by half-turn (180°) and reinstall the control cable.





## 2 Plenum chamber (ventilation and heating) - remove and install



### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- → Electrical equipment, Rep. gr. 27 Starter motor, alternator, battery.*



### Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.

#### Special tools and workshop equipment required

- ◆ Torque wrench - 5 to 50 Nm (inc. 1/2") -VAG 1331-
- ◆ Clamps (diameter 25 mm) -3094-
- ◆ Oil collecting tray -VAG 1306-
- ◆ Standard-type clamp pliers -VW 5162 ou VAS 5024A-
- ◆ Standard-type clamp pliers -VW 5163-

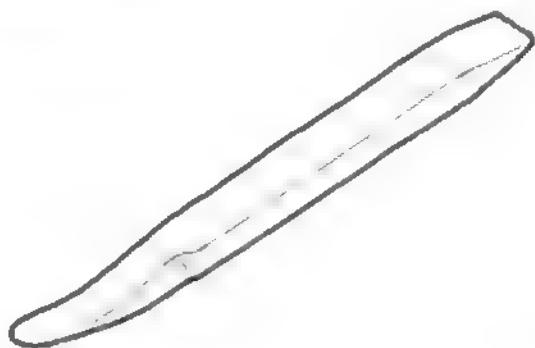


Q87-10005



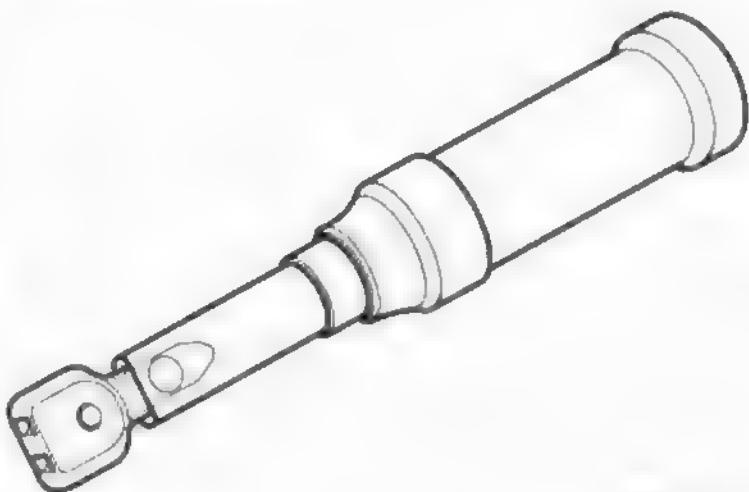
- ◆ Scraper -VW 037-

**VW 037**



Q00-0014

**V.A.G 1783**



Q00-10085

Torque wrench 2 to 10 Nm -VAG 1783-

## 2.1 Plenum chamber (Behr) - remove and install

- ◆ Vehicles with Denso plenum chamber → [page 24](#) .

Assembly overview:



- 1 - Dust and pollen filter
  - Remove and install  
⇒ [page 8](#)
- 2 - Screws
  - 2 units
  - 12 Nm
- 3 - Air distribution command cable
  - Remove and install  
⇒ [page 18](#)
- 4 - Temperature command cable
  - Remove and install  
⇒ [page 18](#)
- 5 - Heat exchanger
  - Remove and install  
⇒ [page 45](#)
- 6 - Left side of transverse support
  - Remove and install ⇒  
Body - Internal assembly work; Rep. gr. 70 ;  
Linings / insulations
- 7 - Screws
  - 2 units
  - 12 Nm
- 8 - Screws
  - 2 units
  - 12 Nm
- 9 - Screws
  - 3 units
  - 5 Nm
- 10 - Heat exchanger/engine compartment partition panel sealing
  - Replace if damaged
  - Note installation position ⇒ [page 4](#)
- 11 - Evaporator compartment
  - Vehicles with air conditioning



## 2.1.1 Removal



### WARNING

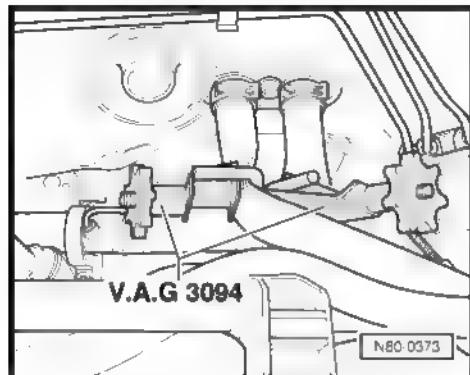
*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C.  
Cooling system is pressurized.*

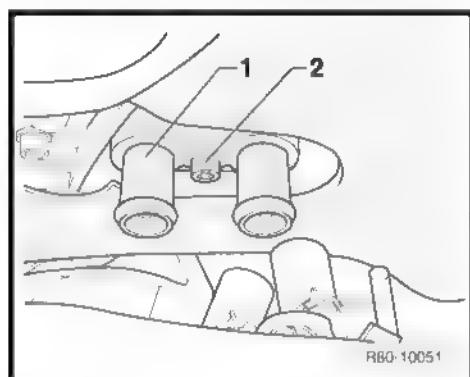
*Before starting any work, reduce pressure and temperature, if required.*



- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-
- Release clamps with the Standard-type clamp pliers -VW 5162 (VWB) - ou - VAS 5024A- and remove hoses.
- Install a hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.



- Remove screw -2- and flange -1-.
- Remove the dash panel ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the direct support for the panel bracket ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the remaining fastening screws.
- Move plenum chamber away from the panel support and release harnesses and connectors fastened to plenum chamber.
- Remove the plenum chamber.



## 2.1.2 Installation

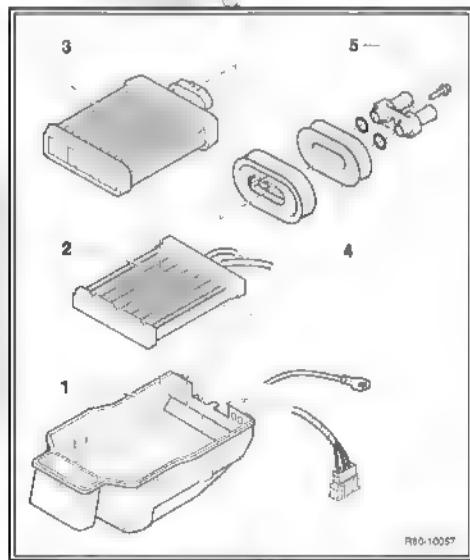
Installation is performed in reverse sequence to the removal, observing the following:

- Mount harnesses and all the connectors in their original positions.
- Screw on the fastening screw -5- with torque of (20 Nm).
- Observe seal installation position -4- and heat exchanger hose position ⇒ [page 4](#) .



*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows:*

- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank , causing coolant level there to decrease).
- Top up coolant tank level ⇒ Engine; Rep. gr. 19 ; Cooling system .



## 2.2 Plenum chamber (Denso) - remove and install

- ◆ Vehicles with Behr plenum chamber [page 22](#) .

Assembly overview:



1 - Cross member

- Remove and install ➤  
Body - Internal assembly works; Rep. gr. 70 ;  
Lining / insulation .

2 - Heat exchanger/engine compartment partition panel sealing

- Replace if damaged
- Note installation position ➤ [page 3](#)

3 - Dust and pollen filter compartment

- Dust and pollen filter -  
remove and install  
➤ [page 9](#)

4 - Screws

- 2 units
- 12 Nm

5 - Heat exchanger

- Remove and install  
➤ [page 45](#)

6 - Air distribution command cable

- Remove and install  
➤ [page 18](#)

7 - Left mounting of transverse support

- Remove and install ➤  
Body - Internal assembly work; Rep. gr. 70 ;  
Linings / insulations

8 - Temperature command cable

- Remove and install ➤ [page 18](#)

9 - Screws

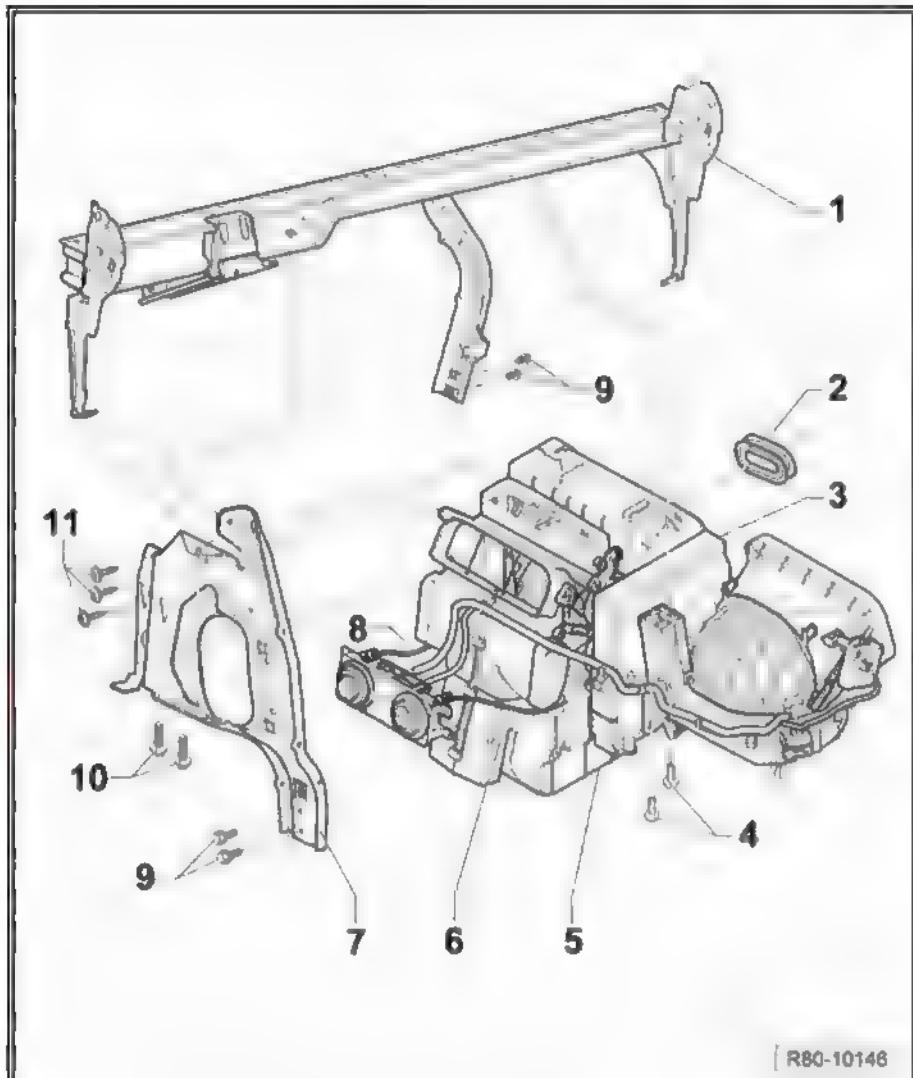
- 4 units
- 12 ± 1.2 Nm

10 - Screws

- 2 units
- 12 Nm

11 - Screws

- 3 units
- 5 ± 0.5 Nm





## 2.2.1 Removal



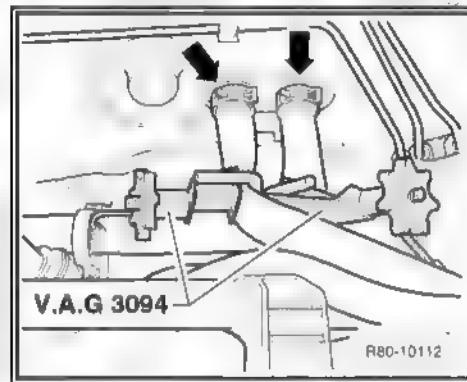
### WARNING

*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C.  
Cooling system is pressurized.*

*Before starting any work, reduce pressure and temperature, if required.*

- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-
- Release the clamps -arrows- with the Standard-type clamp pliers -VW 5162 (VWB) - ou VAS 5024A- and remove the hoses.
- Install a hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.
- Remove the dash panel ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the direct support for the panel bracket ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the remaining fastening screws.
- Move plenum chamber away from the panel support and release harnesses and connectors fastened to plenum chamber.
- Remove the plenum chamber.



## 2.2.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

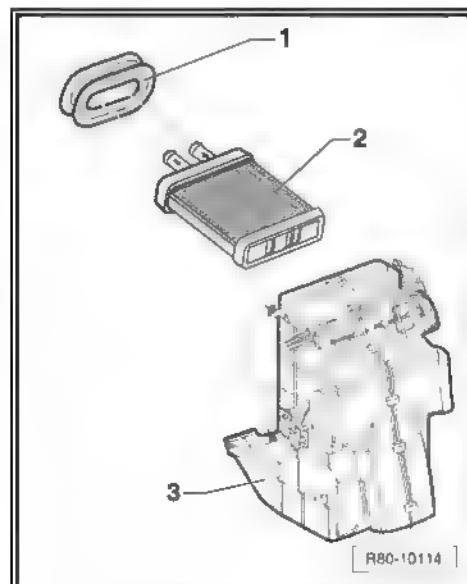
- Mount harnesses and all the connectors in their original positions.
- Observe installation position of seal -1- and of heat exchanger hoses -2- ⇒ [page 3](#) .



### Note

*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows:*

- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank , causing coolant level there to decrease).
- Top up coolant tank level ⇒ Engine; Rep. gr. 19 ; Cooling system .





### 3 Plenum chamber (Behr) - disassem- ble and assemble



#### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- → Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



#### Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.*
- ◆ *When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.*

Assembly overview of plenum chamber (Behr) with ventilation and heating system:



1 - Heater unit harness

2 - Upper plenum chamber part

3 - Support

- Fastened to the transverse support and heat exchanger

4 - Natural air fan pre-resistance with overheating cut-out - N24-

- Remove and install  
⇒ [page 7](#)

5 - Air intake nozzle

- With small cool air and recirculation air door

6 - Sealing

- Replace if damaged

7 - Lower plenum chamber part

8 - Control motor for natural air valve and recirculation valve - V154-

- Remove and install  
⇒ [page 31](#)

9 - Support

10 - Natural air fan -V2- (Behr box)

- Remove and install  
⇒ [page 5](#)

11 - Fan case

12 - Dust and pollen filter cover

13 - Dust and pollen filter

- Remove and install ⇒ [page 8](#)

14 - Air distribution drive mechanism

- Remove and install ⇒ [page 29](#)

15 - Lower plenum chamber part

16 - Additional heating resistance -Z35-

- Diesel engine vehicles only
- Remove and install ⇒ [page 33](#)

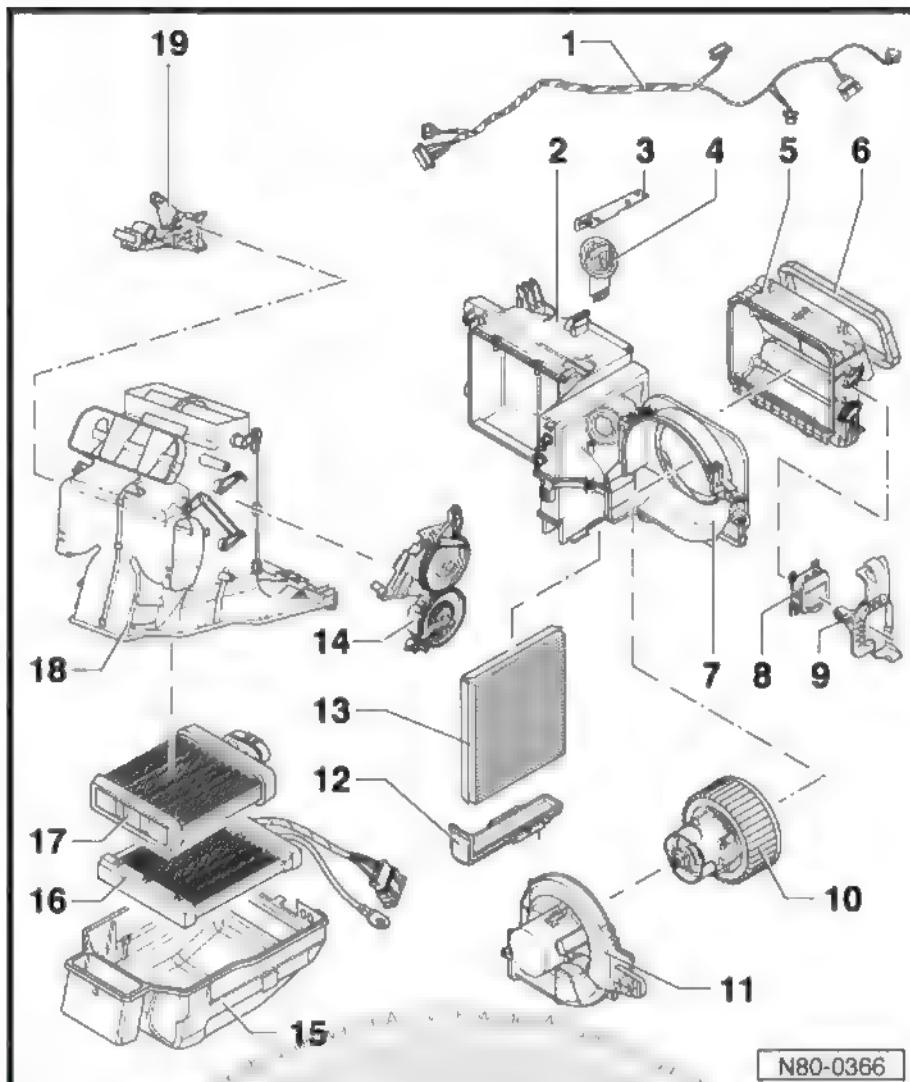
17 - Heat exchanger

- Remove and install ⇒ [page 45](#)

18 - Upper plenum chamber part

19 - Air distribution drive mechanism

- Remove and install ⇒ [page 29](#)

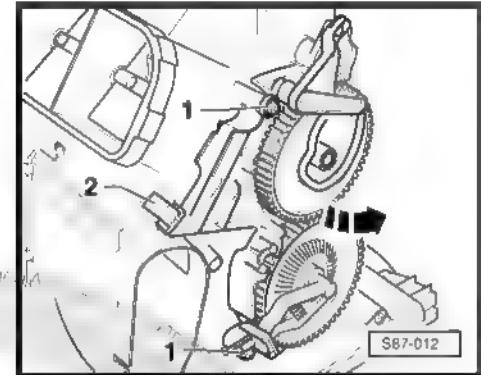




### 3.1 Air distribution drive mechanism (Behr box) - remove and install

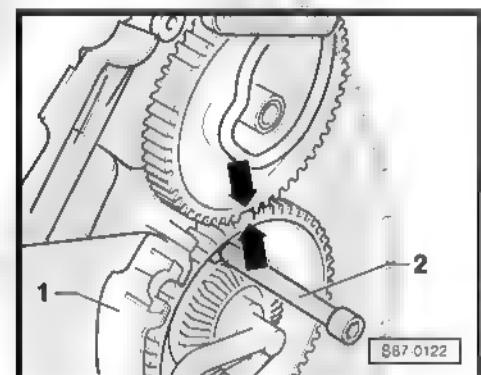
#### 3.1.1 Removal

- Remove plenum chamber [page 22](#).
- Disassemble the upper part of the plenum chamber.
- Remove fastening screws -1-.
- Release locks -2- and remove drive mechanism towards -arrow-.



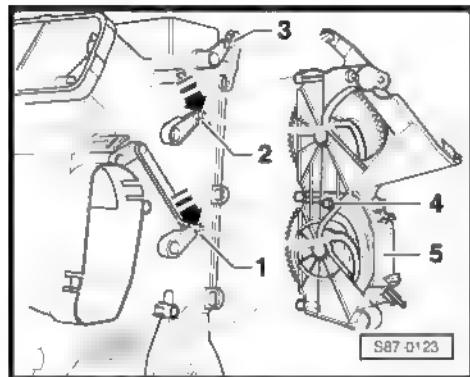
#### 3.1.2 Installation

- Lock drive mechanism gears. To do this, turn the gears until the marks -arrows- fit one inside the other.
- In this position, insert a M6 screw -2- into the lower gear opening with the drive mechanism -1-.





- Place the flap lever of the footwell opening -1- downwards.
- Place the flap lever of the panel opening -2- downwards.
- Place the heated windscreens opening lever -3- so that the flap is fully open.
- Install drive mechanism locked -5- on the three plenum chamber orifices.
- Conduct the drive mechanism in order that the lever pins -1- and -2- engage on the corresponding rails of the drive mechanism -5-.
- Insert the support pin -3- into the corresponding drive mechanism opening -5-.



#### Note

*When installing, it is possible to see the lever pin -1- from outside through an inspection display in the lower gear of the adjustment unit.*

- Check drive mechanism operation.

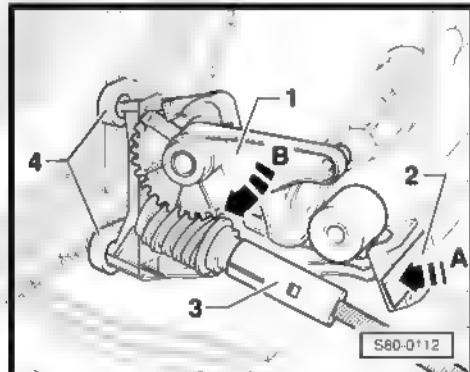
All the flaps must move easily and with no jerking movements; otherwise, remove mechanism and repeat installation.

- Tighten fastening screws to a torque of (1 Nm).

### 3.2 Temperature adjustment mechanism (Behr box) - remove and install

#### 3.2.1 Removal

- Remove the dash panel ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove front left feet air duct ⇒ [page 12](#) .
- Remove command cable -3- from adjustment mechanism ⇒ [page 18](#) .
- Release lock -2- by pressing it towards -arrow A-.
- Move the adjustment mechanism -1- towards -arrow B- and remove from supports -4-.



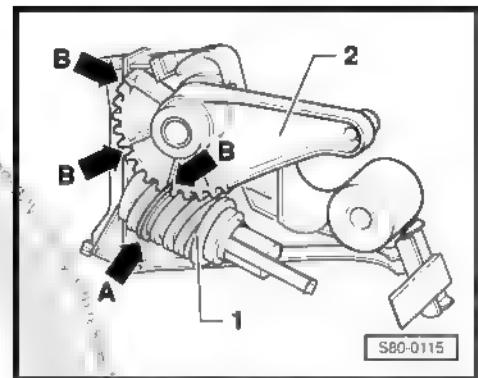


### 3.2.2 Installation



#### Note

- ◆ Before installing, check that the position of the worm gear -1- and gear segment -2- match each other.
- ◆ The larger thread (dark hatched area) -arrow A- shall fit into the deeper tooth intervals -arrow B-

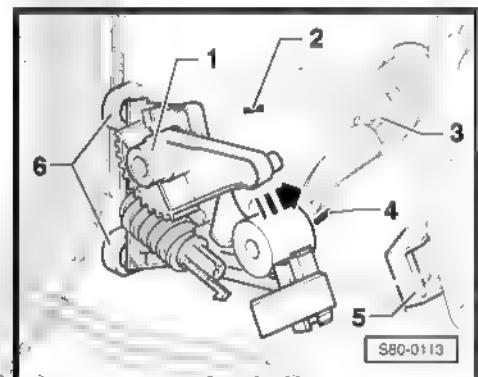


- Mark the lever position -3- with the small temperature adjustment door at the end positions (flap fully open -2- and flap fully closed -4-) in the plenum chamber.
- Place the adjustment mechanism -1- at the fully closed flap position -4-.
- Pull the temperature lever -3- down until the stop.
- Install adjustment mechanism -1- on support -6- and fit the pin on the lever rail -3-.
- Engage lock -5- in the plenum chamber adjustment mechanism.
- Position temperature control button in "cold" position and install command cable in the adjustment mechanism -1-
- Check adjustment mechanism operation.

All the flaps must move freely and with no jerking movements; otherwise, remove mechanism and repeat installation.

The small temperature door must move easily and without jerking movements to its final positions (Marks -2- and -4-); otherwise, remove mechanism and repeat installation.

- Install front left feet air duct [⇒ page 12](#).
- Install the dash panel ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .



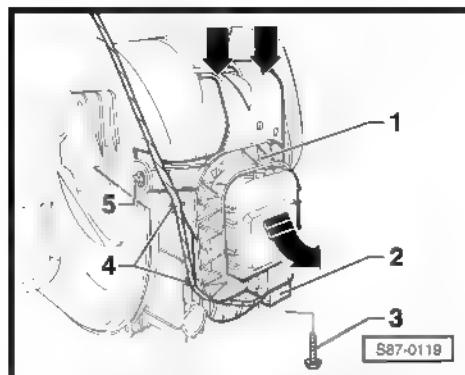
### 3.3 Control motor for natural air valve and recirculation valve -V154- (Behr box) - remove and install

#### 3.3.1 Removal

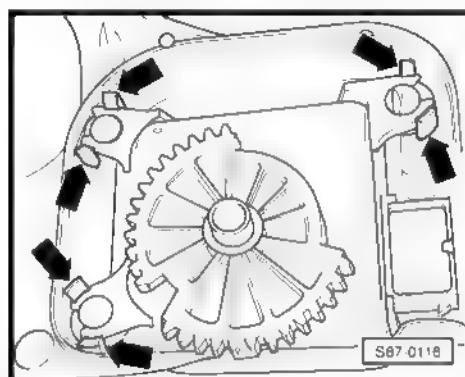
- Remove the Natural air fan -V2- [⇒ page 5](#).



- Carefully cut -4- the cable fastenings.
- Disconnect the connector -2-.
- Remove screws -3 and 5-.
- Press locks and remove support with the Control motor for natural air valve and recirculation valve -V154- -1- towards -arrow-



- Press support locks outwards -arrows- and remove the Control motor for natural air valve and recirculation valve -V154- from support.



### 3.3.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:



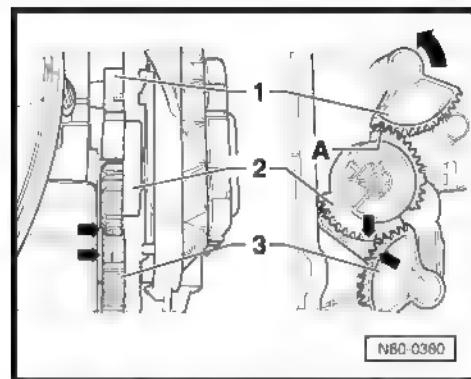
#### Note

- ◆ Control motor for natural air valve and recirculation valve -V154- is different for heating and air conditioning systems - check part number!
- ◆ A new Control motor for natural air valve and recirculation valve -V154- is supplied in the end position "air circulation operation".



The following work stages must be carried out simultaneously:

- ◆ Close the small natural air door -arrow- and keep it closed.
- ◆ Place the Control motor for natural air valve and recirculation valve -V154- so that the first tooth -A- of gear -2- fits in the first interval for teeth segment -1- on fresh air door.
- ◆ Position the small air circulation door so that the marks -arrows- couple to the gear -2- and to the gear segment -3- in the small air circulation door.
- ◆ Press Control motor for natural air valve and recirculation valve -V154- fully on the support.
- Install the screws -3 and 5-.
- Fit power connector.
- Start ignition and check operation of the Control motor for natural air valve and recirculation valve -V154- by pressing the air circulation button.

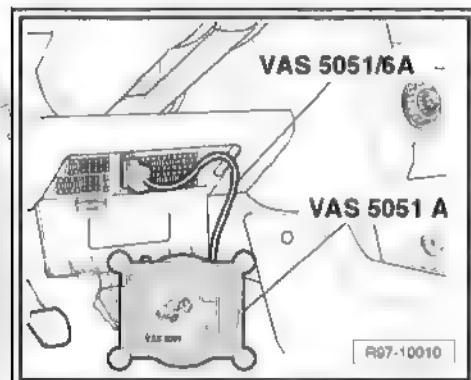


**Note**

- ◆ The small natural air door and the circulation air door must move freely and with no jerking movements until their final positions.
- ◆ Turn the ignition off immediately if the system malfunctions and repeat the installation.
- Check the operation with the Diagnosis, Measurement and Information System -VAS 5051A- [page/33](#)

### 3.4 Control motor for natural air valve and recirculation valve -V154- - check

- Connect Diagnosis, measurement and information system - VAS 5051A- or later equipment ⇒ General Information; Rep. gr. 97 ; Electric cables and harnesses .
- Proceed by selecting the desired functions ⇒ Vehicle diagnostic tester.



### 3.5 Additional heating resistance -Z35- - remove and install

**Note**

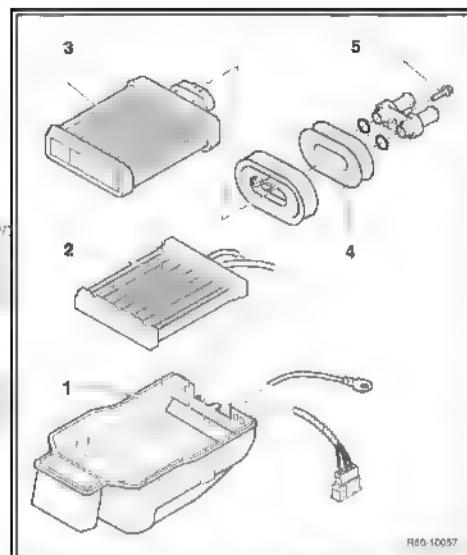
The Additional heating resistance -Z35- is only installed in diesel engines.



### 3.5.1 Removal

For vehicles with diesel engine:

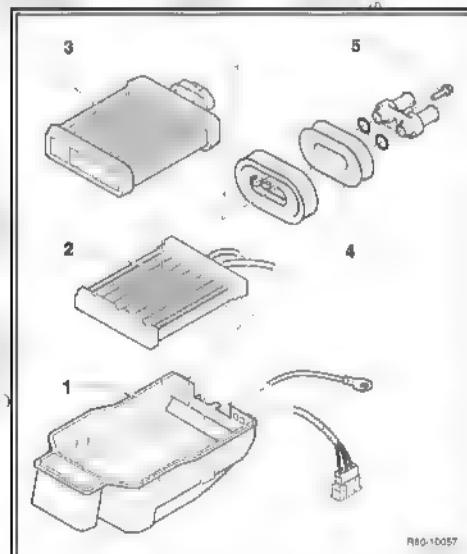
- Remove heat exchanger -3- [⇒ page 45](#).
- Disengage the connector.
- Remove the Additional heating resistance -Z35- -2-.



### 3.5.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

- Install the Additional heating resistance -Z35- -2-.
- Install the heat exchanger [⇒ page 45](#).
- Tighten screw -5- to 20 Nm.
- Observe seal installation position -4- and heat exchanger hose position [⇒ page 4](#).



## 3.6 Additional heating resistance -Z35- - check

Additional heating resistance -Z35- with peripheral mechanism:

Additional heating resistance -Z35- with peripheral mechanism (DF alternator terminal charge signal), Low intensity heating relay -J359-, High intensity heating relay -J360-, Intake manifold temperature sensor -G72-, Coolant temperature sensor -G62- can be verified through the engine command unit self-diagnosis

### 3.6.1 Additional heating resistance -Z35- - check

Special tools and workshop equipment required

- ◆ Portable multimeter or VAG 1526C -EQ 7318- or Portable multimeter or EQ 7318 -VAG 1526C- or Multimeter -VAG 1715-



- ◆ Current loop diagram
- ◆ Auxiliary measuring cable set -VAG 1594C-
- ◆ Digital potentiometer (included in VAG 1594C) -VAG 1630-
- ◆ Diagnosis, Measurement and Information System -VAS 5051A- or later equipment

#### Checking conditions:

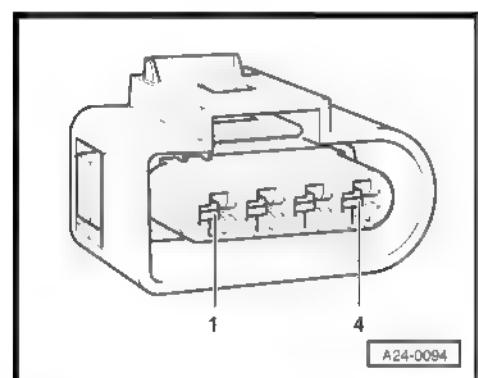
- Intake air temperature below 19°C.
- Coolant temperature below 80°C.
- Cabin temperature at 20°C.
- Battery voltage greater than 11 V
- Alternator charge equal to or less than 50% (DF terminal).
- Engine speed regime superior to 450 rpm.
- Control button for ventilation level in position 4.
- Control button for internal temperature in maximum heating position.

#### Checking sequence:

If the intake temperature and coolant values specifications are not achieved, carry out the following checks.

The intake air temperature sensor and the intake manifold pressure sensor are housed in the same compartment in the intake manifold.

- Connect the Digital potentiometer (included in VAG 1594C) -VAG 1630- to the Intake manifold temperature sensor -G72- connector between contacts -1- and -4-.

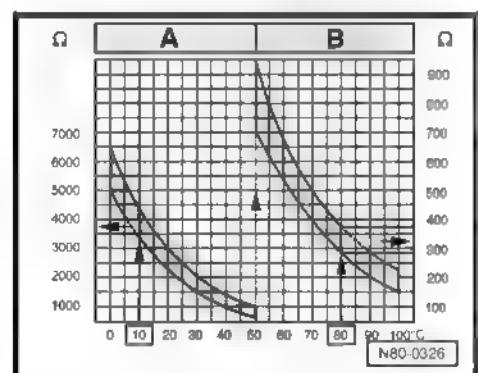


#### Rated values, check the diagram.

-Position A- represents the resistance values for temperatures ranging between 0 and 50°C; -position B- represents the values for temperatures ranging between 50 and 100°C.

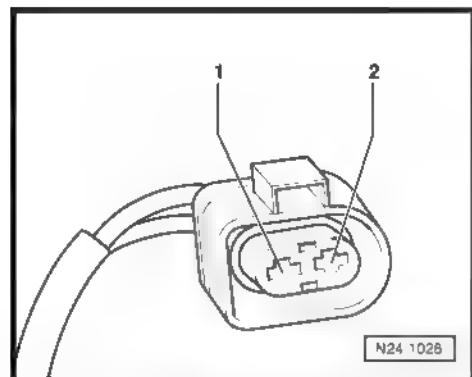
#### Sample reading:

- ◆ 10 °F corresponds to a resistance of 3500...4000 Ω.
- ◆ 80 °F corresponds to a resistance of 275...375 Ω.
- Disconnect connector of Coolant temperature sensor -G62- ⇒ Engine, Rep gr 19 ; Cooling system .





- Connect the Digital potentiometer (included at VAG 1594 C) - VAG 1630- to the Coolant temperature sensor -G62- connector between contacts -1- and -2-.

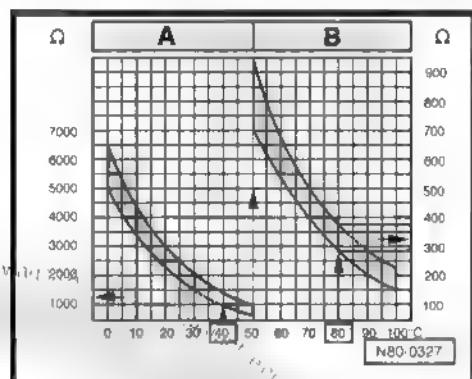


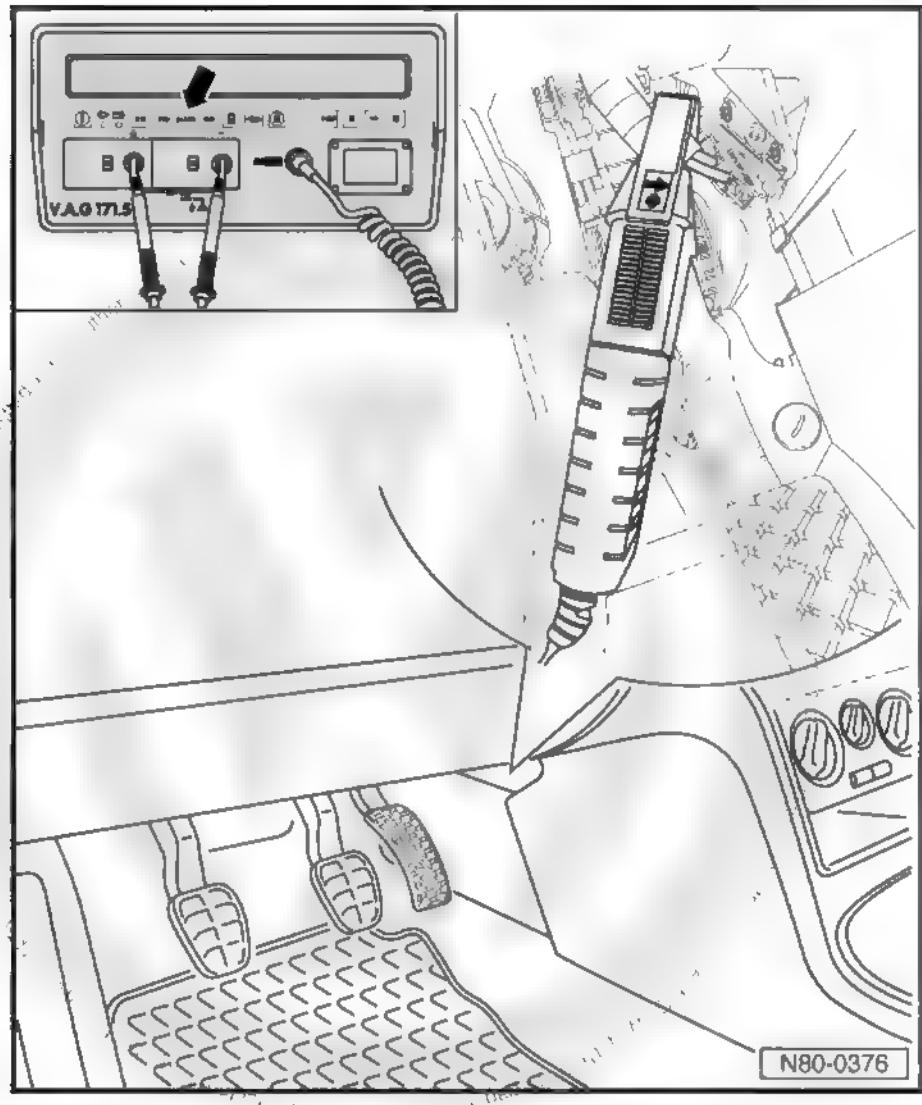
Rated values, check the diagram.

-Position A- represents the resistance values for temperatures ranging between 0 and 50°C; -position B- represents the values for temperatures ranging between 50 and 100°C.

Sample reading:

- ◆ 40°C corresponds to a resistance of 1000...1500 Ω.
- ◆ 80 °F corresponds to a resistance of 275...375 Ω.
- Connect Multimeter -VAG 1715- with the electric caliper to the thermal element power cable of the Additional heating resistance -Z35- .





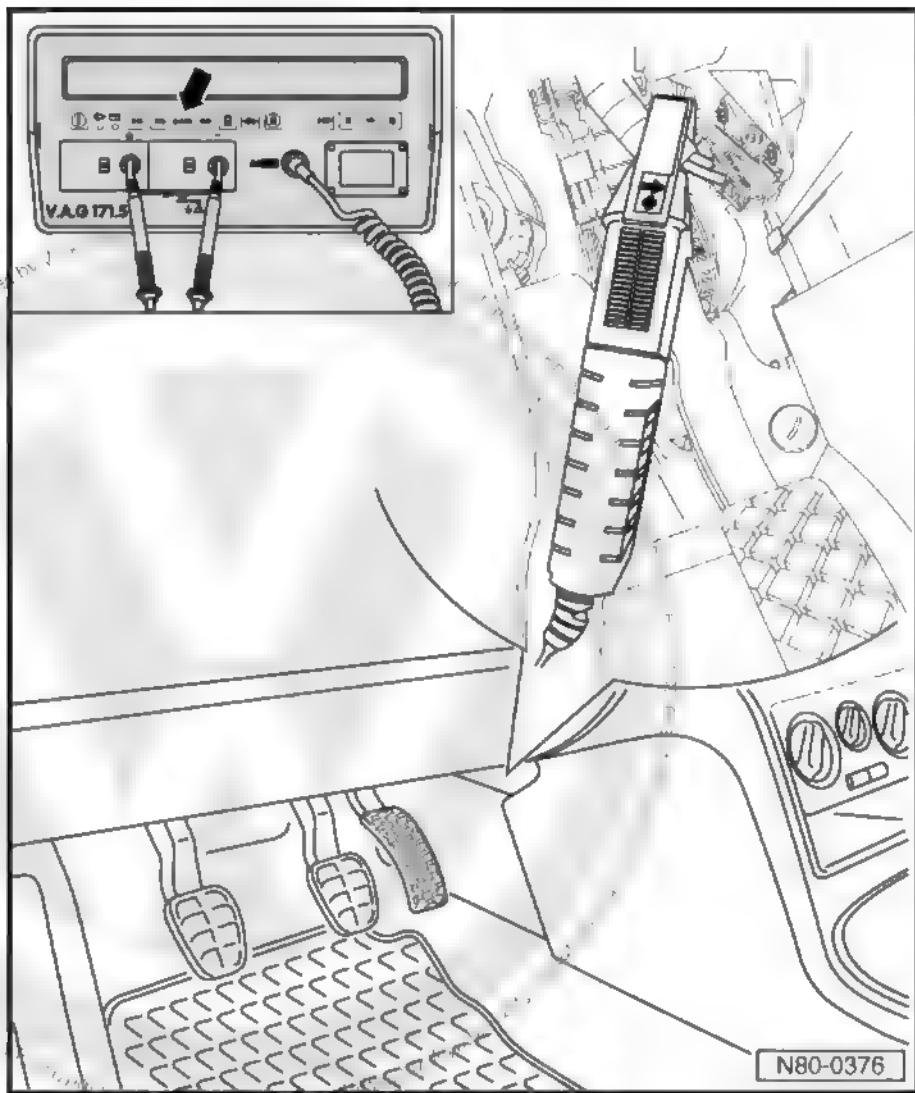
- Set the Multimeter -VAG 1715- for verification in amperes.

10 seconds after the engine has been turned on, the heating element for the Additional heating resistance -Z35- is released by Control unit of the direct Diesel injection system -J248-. The three thermal elements are gradually switched on and off through the engine command unit relay.

- Start the engine and leave it at idling speed.

Switch off air conditioning, if present

In the checking conditions defined, the Additional heating resistance -Z35- starting current is equal or superior to approximately 38.9 A. After a heating-up phase of approximately 10 minutes of the Additional heating resistance -Z35- the current consumption will drop to 31.6 A. If the amount decreases by 10 A or more, check the cables according to the electric diagram.



If no fault is found in the cables:

- Replace the Additional heating resistance -Z35- [⇒ page 33](#) .
- Erase the fault memory ⇒ Vehicle diagnostic tester.



## 4 Plenum chamber (Denso) - disassemble and assemble



### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- → Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



### Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.*
- ◆ *When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.*

Assembly overview of plenum chamber (Denso) with ventilation and heating system:



1 - Sealing

- Replace if damaged

2 - Upper plenum chamber part

3 - Lower plenum chamber part

4 - Clip

- Replace if damaged

5 - Natural air fan -V2- (Denso Box)

- Remove and install  
⇒ [page 6](#)

6 - Natural air fan pre-resistance with overheating cut-out-N24-

- Remove and install  
(Denso box) ⇒ [page 8](#)

7 - Dust and pollen filter cover

8 - Bushing

9 - Screw

- 1,5 Nm

10 - Heater unit harness

11 - Air distribution command cable

- Remove and install  
⇒ [page 18](#)

12 - Temperature command cable

- Remove and install  
⇒ [page 18](#)

13 - Plenum chamber (Denso)

- Remove and install  
⇒ [page 24](#)

14 - Heat exchanger

- Remove and install ⇒ [page 45](#)

15 - Heat exchanger sealing

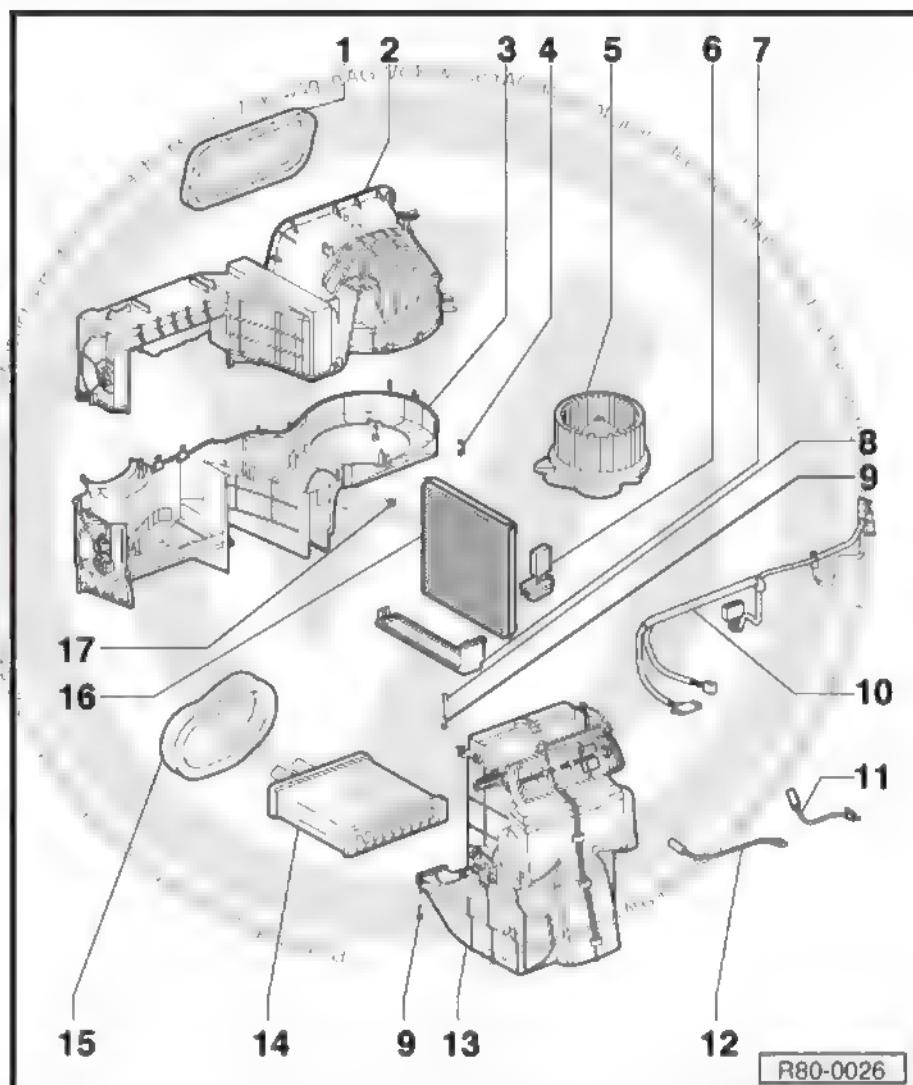
- Replace if damaged

16 - Dust and pollen filter

- Remove and install ⇒ [page 9](#)

17 - Clip

- Replace if damaged



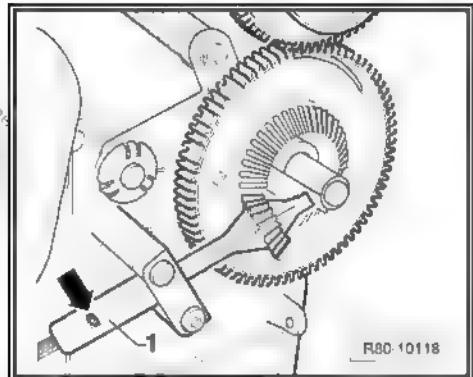
#### 4.1 Air distribution drive mechanism (Denso box) - remove and install

##### 4.1.1 Removal

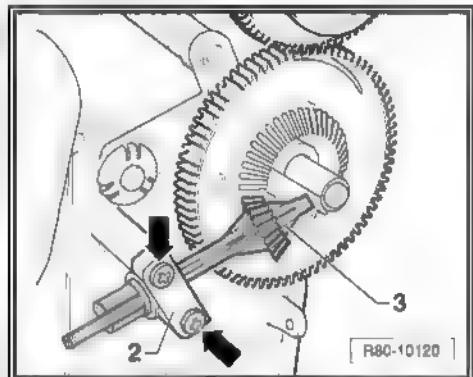
- Remove plenum chamber ⇒ [page 24](#).
- Disassemble the upper part of the plenum chamber.



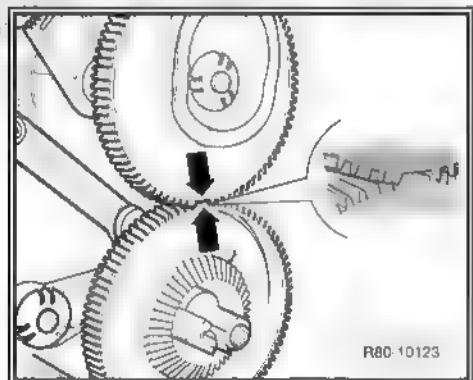
- Press the lock -arrow-, and remove the operating mechanism -1- cable.



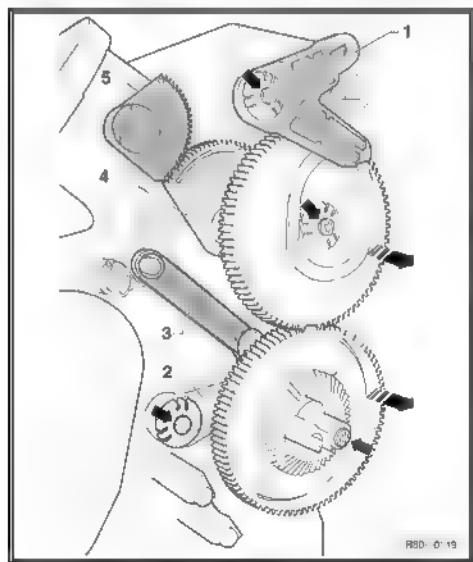
- Loosen fastening screws -arrows-, disengage bearing -2- and remove distribution lever -3-.



- Position the gears of the operating mechanism so that markings -arrows- match up, one within the other.



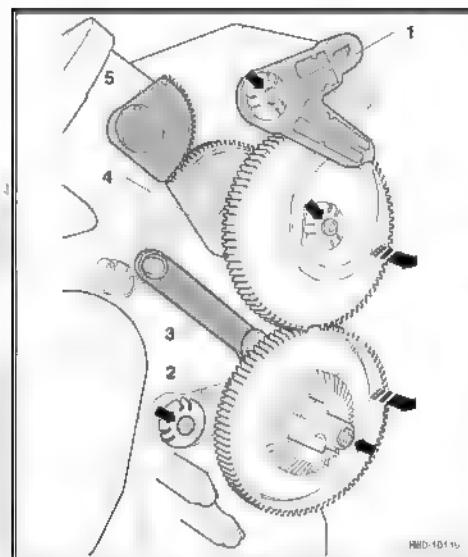
- Mark positions of levers -1, 2, 3, 4 and 5-; loosen fastening screws -arrows-.
- Remove gear and lever set in the direction of the -arrows-.





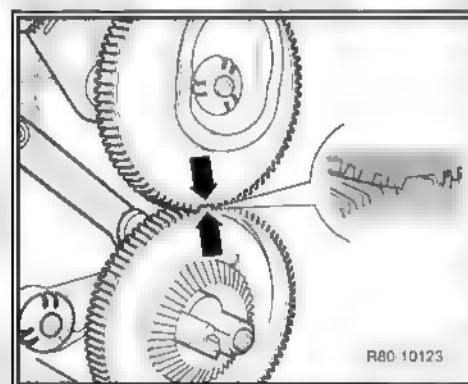
#### 4.1.2 Installation

- Assemble and position levers -2, 3, 4 and 5- in accordance with proper markings.



- Position the gears of the operating mechanism so that markings -arrows- match up, one within the other.
- Assemble upper lever.
- After installation, check the operation of the adjustment mechanism.

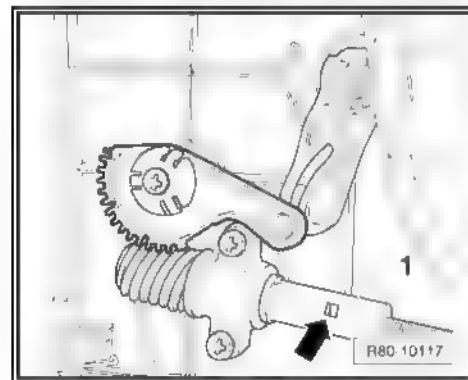
All the small hatches must move freely; otherwise, remove the mechanism and repeat installation.



#### 4.2 Temperature adjustment mechanism (Denso box) - remove and install

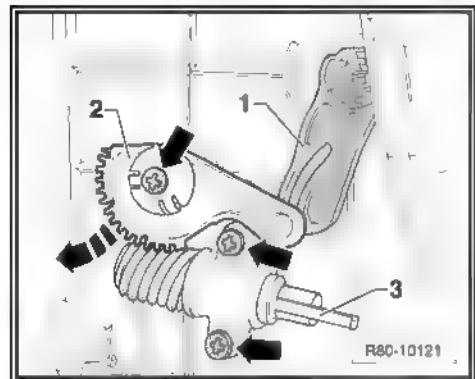
##### 4.2.1 Removal

- Remove instrument panel => Body - Internal assembly works; Rep. gr. 70 ; Instrument panel - remove and install
- Remove front left feet air duct [⇒ page 12](#).
- Press the lock -arrow-, and pull out the command cable -1- for the temperature adjustment mechanism.





- Mark position of the levers -1 and 2- with the temperature adjustment hatch in the fully closed position.
- Loosen fastening screws -arrows- and remove mechanisms -2 and 3- for temperature adjustment, in the direction of the -arrow-



## 4.2.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

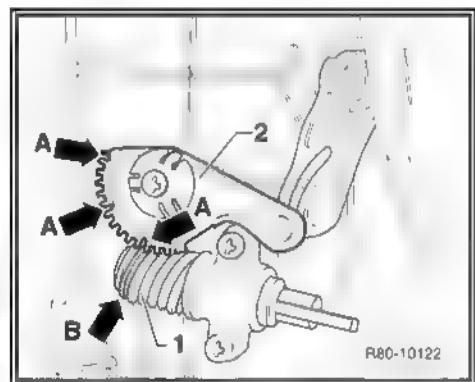


### Note

- ◆ Before installing, check that the position of the worm gear -1- and gear segment -2- match each other.
- ◆ The larger thread (dark hatched area) -arrow A- shall fit into the deeper tooth intervals -arrow B-.

- Install adjustment mechanism -1 and 2- with the small temperature adjustment hatch lever in fully closed position.
- After installation, check the operation of the adjustment mechanism.

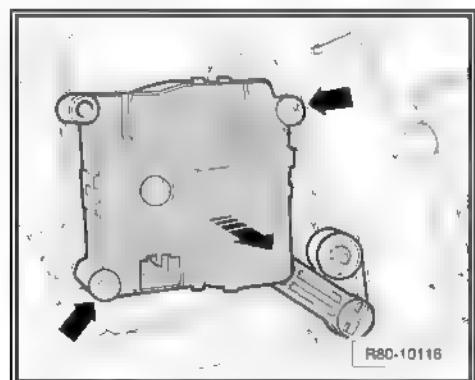
All the small hatches must move freely; otherwise, remove the mechanism and repeat installation.



## 4.3 Control motor for natural air valve and recirculation valve -V154- (Denso box) - remove and install

### 4.3.1 Removal

- Disconnect Control motor for natural air valve and recirculation valve -V154- connector.
- Loosen the fastening screws -arrows-, and remove the Control motor for the natural air valve and recirculation valve -V154- in the direction of the -arrow-.



### 4.3.2 Installation

Installation is performed in reverse sequence to the removal, observing the following

**Note**

*A new Control motor for natural air valve and recirculation valve -V154- is supplied in the end position "air circulation operation".*



## 5 Heat exchanger - remove and install

Heat exchanger (Denso plenum chamber) [⇒ page 46](#).

Heat exchanger (Behr plenum chamber) [⇒ page 47](#).



### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- ⇒ Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*

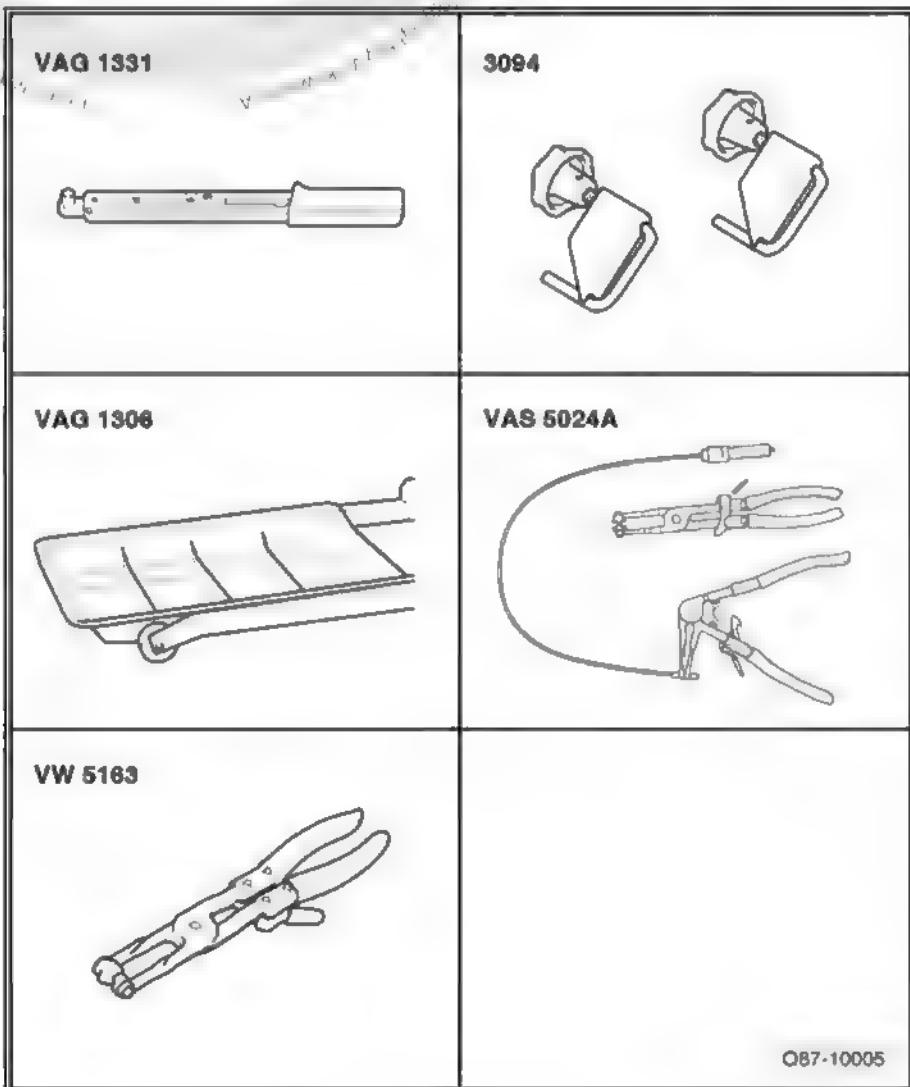


### Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.

#### Special tools and workshop equipment required

- ◆ Torque wrench - 5 to 50 Nm (enc. 1/2") -VAG 1331-
- ◆ Clamps (diameter 25 mm) -3094-
- ◆ Oil collecting tray -VAG 1306-
- ◆ Standard-type clamp pliers -VW 5162 ou VAS 5024A-
- ◆ Standard-type clamp pliers -VW 5163-



Q87-10005



## 5.1 Heat exchanger (Denso box) - remove and install



### WARNING

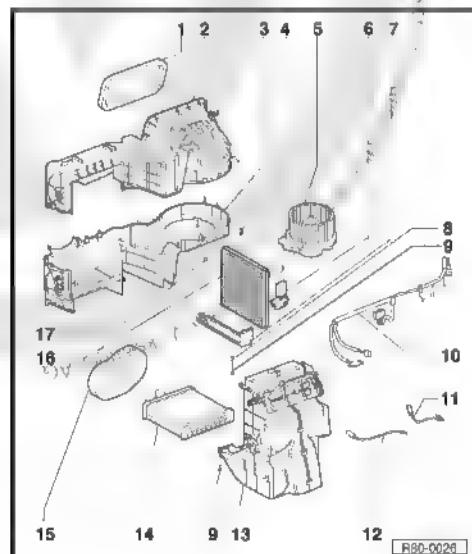
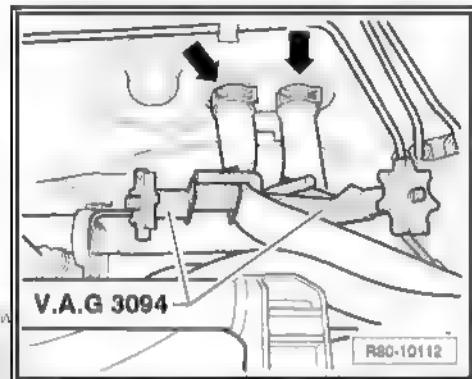
*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C.  
Cooling system is pressurized.*

*Before starting any work, reduce pressure and temperature, if required.*

### 5.1.1 Removal

- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-
- Release the clamps -arrows- with the Standard-type clamp pliers -VW 5162 (VWB) - ou - VAS 5024A- and remove the hoses.
- Install a compressed air hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.
- Remove expansion valve, if any [page 120](#).
- Remove the radio from the dash panel  $\Rightarrow$  Communication; Rep. gr. 91 ; Radio, telephone, navigation system .
- Remove the Combined instrument  $\Rightarrow$  Electrical system; Rep. gr. 90 ; Instrument case, indicators .
- Remove the dash panel  $\Rightarrow$  Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the direct support for the panel bracket  $\Rightarrow$  Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the remaining fastening screws.
- Move plenum chamber away from the panel support and release harnesses and connectors fastened to plenum chamber.
- Remove plenum chamber from its housing.
- Disassemble the upper and lower sections of the plenum chamber -2- and -3-.
- Pull out the heat exchanger -14- from the plenum chamber -13-.





### 5.1.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:



#### WARNING

*Observe the correct assembly position of the heat exchanger with respect to the lower part of the plenum chamber.*

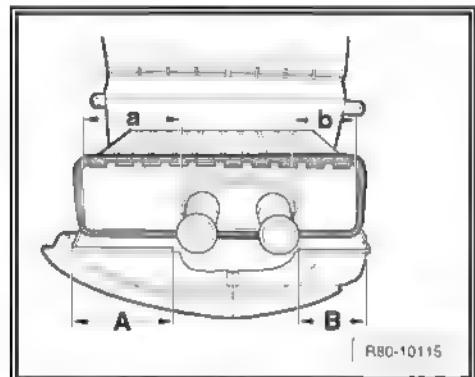
Assembly position for the heat exchanger:

- Position the heat exchanger in lower part of plenum chamber so that marks -A- and -a- (larger) MATCH, and follow the same reference with marks -B- and -b- (smaller).



#### Note

*The heat exchanger must be assembled correctly to prevent water infiltration into the vehicle.*



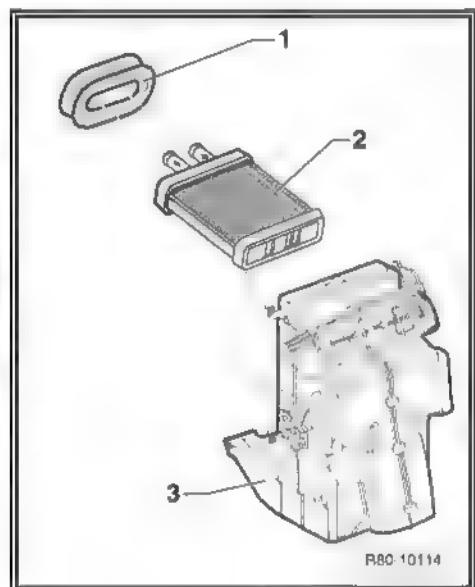
- Observe the installation position of the seal -1- and of the hoses on the heat exchanger -2- [⇒ page 3](#).



#### Note

*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows:*

- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank, causing coolant level there to decrease).
- Top up coolant tank level ⇒ Engine; Rep. gr. 19 ; Cooling system .



### 5.2 Heat exchanger (Behr box) remove and install



#### WARNING

*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C. Cooling system is pressurized.*

*Before starting any work, reduce pressure and temperature, if required.*



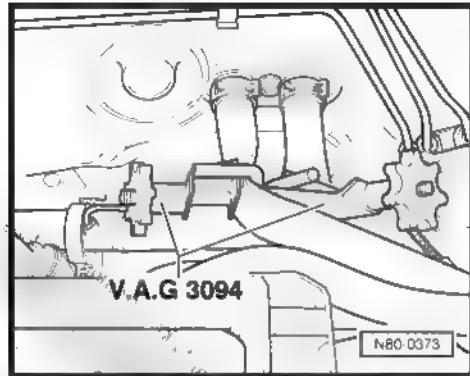
## 5.2.1 Removal



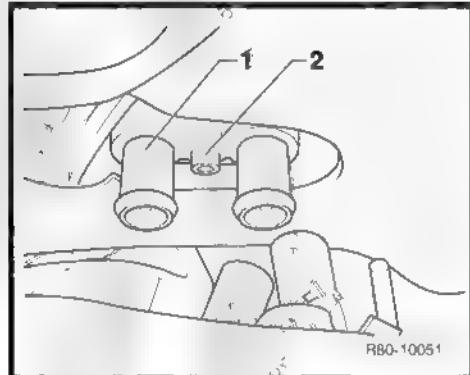
### Note

*It is not necessary to remove the dash panel and the plenum chamber in order to remove and install the heat exchanger.*

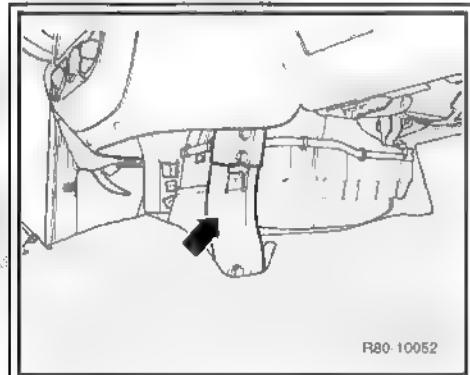
- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-
- Release clamps with the Standard-type clamp pliers -VW 5162 (VWB) - ou - VAS 5024A- and remove hoses.
- Install a compressed air hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.



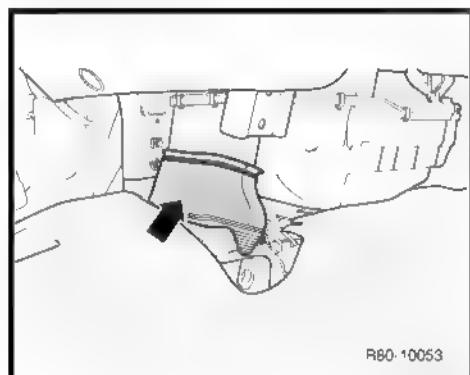
- Remove screw -2- and flange -1-.
- Remove the centre console ⇒ Body - Internal assembly work; Rep. gr. 68 ; Internal equipment .



- Remove the lower part of the right support for the panel bracket -arrow- ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .

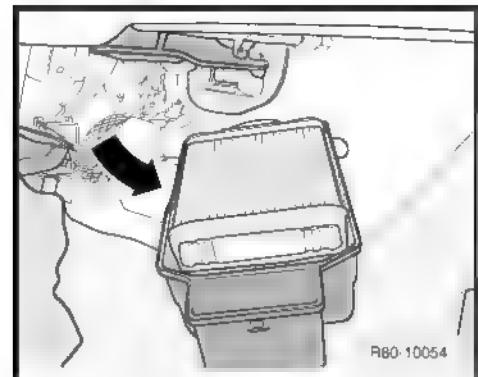


- Remove coupling for rear air duct -arrow- (Europe vehicles only).
- Set aside the carpet and the noise insulation
- Loosen nuts and move the Airbag control unit -J234- to the left (it is not necessary to disconnect the module) ⇒ Body - Internal assembly works; Rep. gr. 69 ; Passenger protection .





- Release locks and remove lower part of plenum chamber to the right.

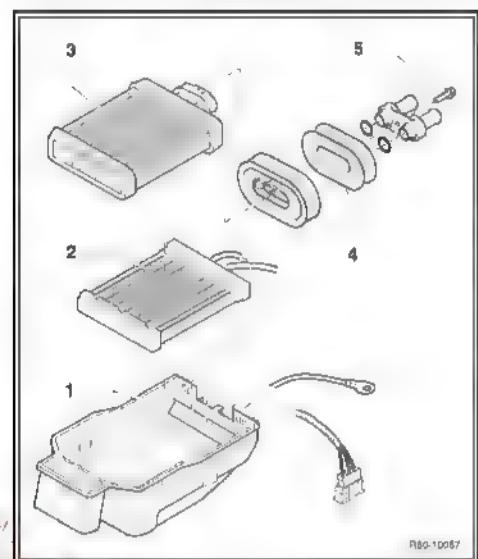


- Remove the lower part of the plenum chamber -1-.
- Remove heat exchanger -3-.



**Note**

*The Auxiliary heating resistance -Z35- -2- only exists for certain models. Removal and installation [⇒ page 33](#).*



## 5.2.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:



### WARNING

*Observe the correct assembly position of the heat exchanger with respect to the lower part of the plenum chamber.*

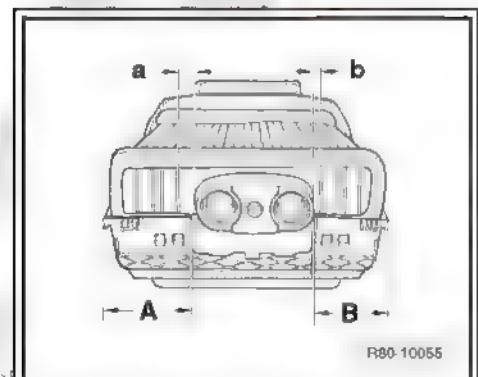
Assembly position for the heat exchanger:

- Position the heat exchanger in lower part of plenum chamber so that marks -A- and -a- (larger) COINCIDE, and do the same with marks -B- and -b- (smaller).



**Note**

*The heat exchanger must be assembled correctly to prevent water infiltration into the vehicle.*



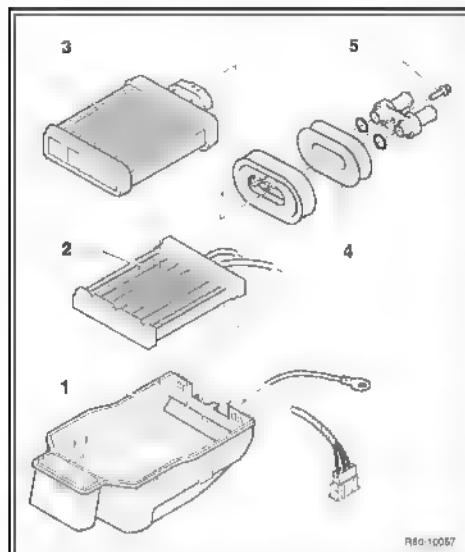


- Tighten screw -5- to 20 Nm.
- Observe seal installation position -4- and heat exchanger hose position [page 4](#).



*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows:*

- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank, causing coolant level there to decrease).
- Top up coolant tank level ⇒ Engine; Rep. gr. 19 ; Cooling system .



## 6 Plenum chamber (ventilation) - remove and install



## WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A  $\Rightarrow$  Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*

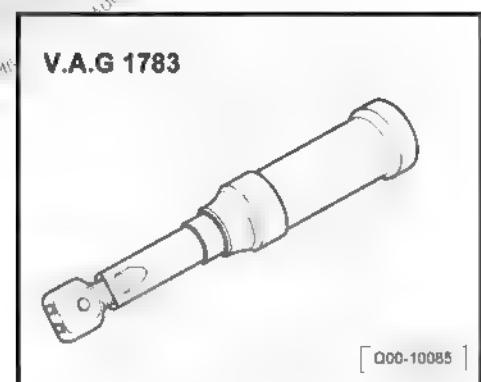


### Note

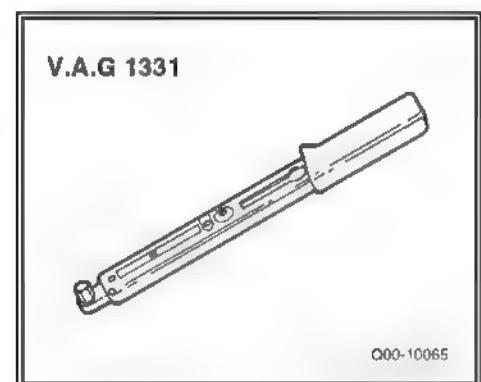
- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.

#### Special tools and workshop equipment required

◆ Torque wrench 2 to 10 Nm -VAG 1783-



◆ Torque wrench - 5 to 50 Nm ( enc. 1/2") -VAG 1331-



## 6.1 Plenum chamber ventilation (Denso) - remove and install



1 - Cross member

- Remove and install →  
Body - Internal assembly works; Rep. gr. 70 ;  
Lining / insulation .

2 - Screws

- 2 units
- $12 \pm 1.2$  Nm

3 - Plenum chamber (ventilation)

4 - Left mounting of transverse support

- Remove and install →  
Body - Internal assembly work; Rep. gr. 70 ;  
Linings / insulations

5 - Screws

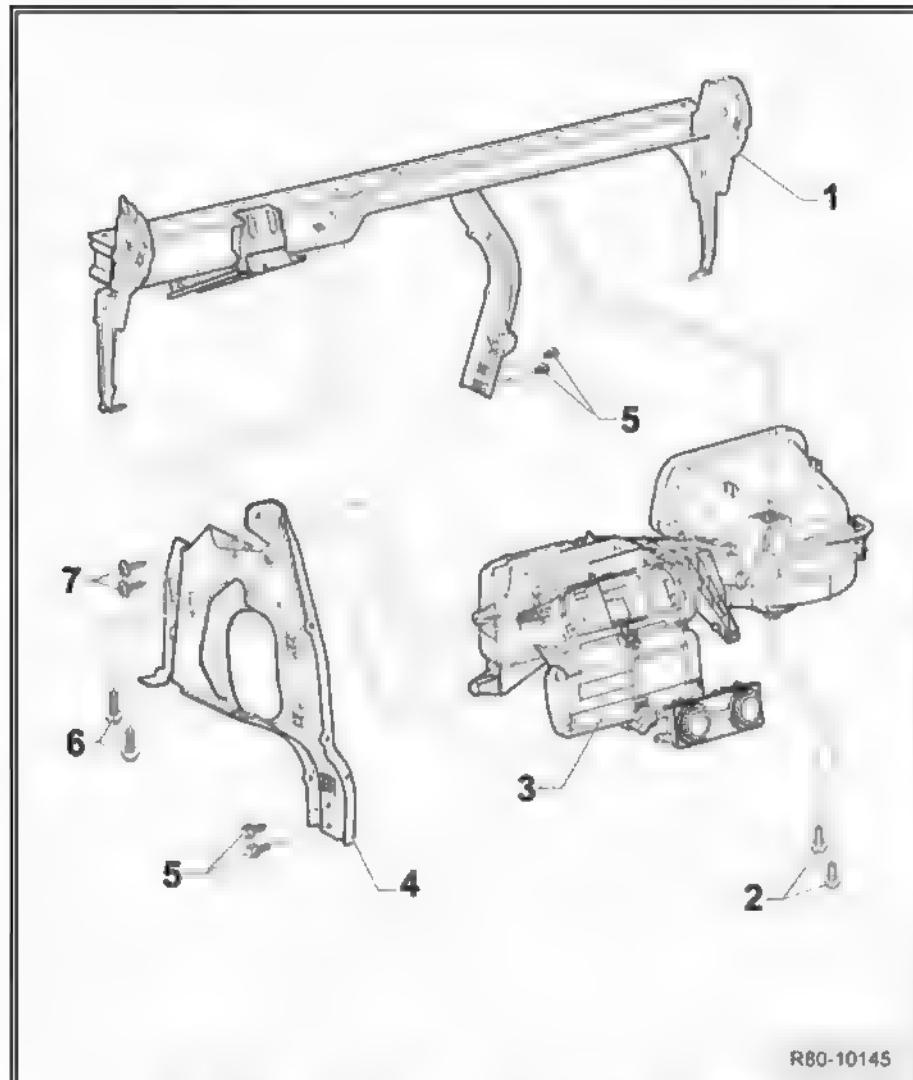
- 4 units
- $12 \pm 1.2$  Nm

6 - Screws

- 2 units
- 12 Nm

7 - Screws

- 2 units
- $5 \pm 0.5$  Nm



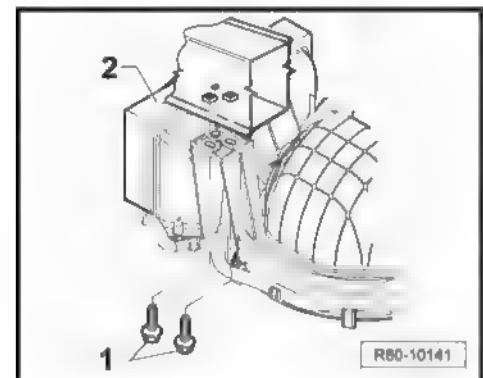
R80-10145

### 6.1.1 Removal

- Turn off the ignition and all electrical equipment, and remove the key from ignition.
- Disconnect the Battery -A- ⇒ Electrical devices; Rep. gr. 27 ; Starter motor, alternator, battery .
- Remove the Radio -R- or "CD player" -R89- from the instrument panel ⇒ Communication; Rep. gr. 91 ; Radio equipment .
- Remove the switches from the instrument panel ⇒ Electrical equipment; Rep. gr. 96 ; Switches, lights and internal lights, alarm .
- Remove the centre frame of the dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Linings/insulations .
- Remove ventilation adjustment mechanism ⇒ [page 15](#) .
- Remove the steering wheel ⇒ Chassis, axles, steering; Rep. gr. 48 ; Steering .
- Remove the steering column covering ⇒ Body - Internal assembly work; Rep. gr. 70 ; Lining / Insulation .
- Remove the turn signal and wiper/washer switches ⇒ Electrical system, Rep. gr. 94 ; Switches, lights, and external lamps .



- Remove the dash panel → Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove demister nozzle and air distributor to the central baffle → [page 13](#) .
- Remove front left footwell air duct → [page 12](#) .
- Remove footwell air duct (front right) → [page 12](#) .
- Loosen the fastening screws -1- from the plenum chamber -2-.
- Remove support (right side) for the panel bracket → Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation .
- Carefully separate the plenum chamber from the panel and disconnect the connectors from the plenum chamber.
- Remove the plenum chamber.



### 6.1.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

- Mount harnesses and all the connectors in their original positions.





## 7 Plenum chamber (ventilation) - disassemble and assemble



### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- → Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



### Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.

## 7.1 Plenum chamber ventilation (Denso) - assembly overview



### Note

*Only for vehicles with forced air ventilation system.*



1 - Upper plenum chamber part

2 - Sealing

Replace if damaged

3 - Lower plenum chamber part

4 - Clip

5 - Natural air fan -V2- (Denso Box)

Remove and install  
[= page 6](#)

6 - Natural air fan pre-resistance with overheating fuse - N24- (Denso Box)

Remove and install  
[= page 8](#)

7 - Harnesses

8 - Air distribution command cable

Remove and install  
[= page 18](#)

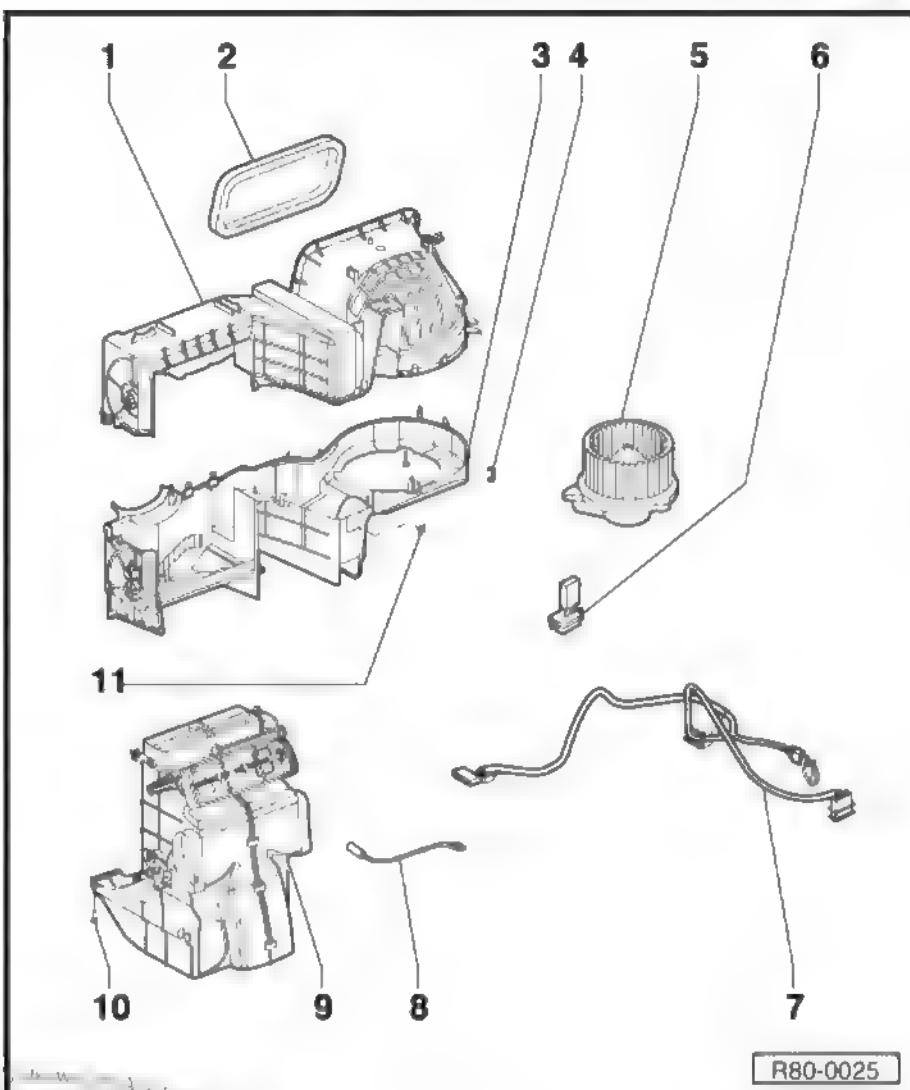
9 - Air distributor chamber

10 - Screw

1,5 Nm

11 - Clip

Replace if damaged



R80-0025



## 87 – Air conditioning system

### 1 Notes on repairing vehicles with air conditioning system and on handling refrigerant



#### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- ⇒ Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



#### Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.

Additional information and safety measures related to R134a refrigerant ⇒ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .

#### Other information:

- ◆ The current flow diagrams are found by selecting the Electric diagrams icon ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Repairs to the refrigerant circuit must only be performed at authorized and specialized technical assistance workshops.
- ◆ A warning sign on the engine compartment lock support provides information about the refrigerant used and the filling capacity.



## 2 Ventilation adjustment mechanism (heating and air conditioning).



### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- ➔ Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



### Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.*
- ◆ *When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.*

### 2.1 Ventilation / air conditioning adjustment mechanism power connectors

For vehicles equipped with an air conditioning system:

- ◆ *Vehicles with heating system ➔ page 17.*

**Remove and install ventilation control unit ➔ page 15.**

Position of multiple connector (A and B) on rear part of heating and air conditioning adjustment, Climatic:

- A- Housing for 5-pole supply connector.

-1- Ventilation level 4.

-2- Ventilation level 3.

-3- Ventilation level 2.

-4- Ventilation level 1.

-5- Terminal -X- contact.

- B- Housing for 8-pole supply connector.

-1- Lighting (+).

-2- A/C.

-3- Earth (-).

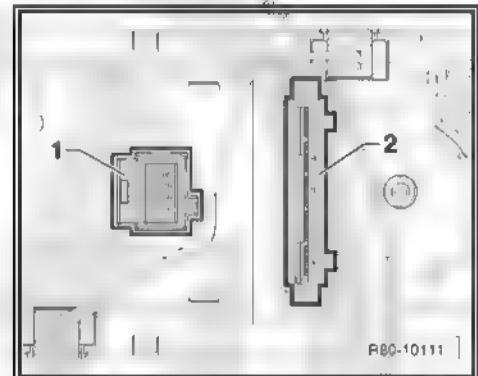
-4- Wrench (+).

-5- Fresh air

-6- Recirculation.

-7- Switch (+)

-8- Battery (+).





## 2.2 Ventilation / air conditioning adjustment mechanism power connectors (Europe vehicles only)

For vehicles equipped with an air conditioning system.

◆ Vehicles with heating system [page 18](#).

Remove and install ventilation control unit [page 16](#).

Position of multiple connector (A, B and C) on rear part of heating and air conditioning adjustment, Climatic:

- A- Housing for 5-pole supply connector.

-1- Ventilation level 4.

-2- Ventilation level 3.

-3- Ventilation level 2.

-4- Ventilation level 1.

-5- Terminal -X- contact.

- B- Housing for 16-pole supply connector.

-1- High pressure sensor -G65- .

-3- Relay for first speed of the radiator fans V7 and V35 -J279- .

-6- Relay for second speed of the radiator fans V7 and V35 -J513- .

-8- CAN High (optional).

-11- CAN Low (optional).

-13- Terminal 31.

-14- Terminal 15.

-15- Adjustment valve for the air conditioning compressor -N280- .

-16- Terminal 30 (optional).

- C- Housing for 18-pole supply connector.

-2- Air outlet temperature sensor for the central baffle -G191- .

-3- Air outlet temperature sensor for the evaporator -G263- .

-4- Signal grounding for baffle temperature sensor

-5- Air outlet temperature sensor for the footwell -G192- .

-7- Signal grounding for potentiometer, step motor.

-10- Temperature adjustment valve control motor potentiometer -G92- .

-11- + 5V 10 mA for control motor potentiometer.

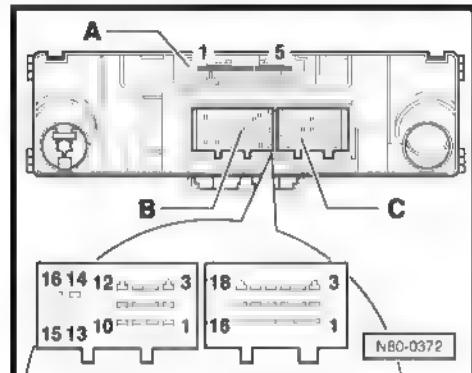
-12- Potentiometer in control motor for circulation door V154

-13- Control motor for temperature adjustment valve -V68- .

-15- Control motor for fresh air valve and recirculation valve -V154- .

-16- Control motor for temperature adjustment valve -V68- .

-18- Control motor for fresh air valve and recirculation valve -V154-





### 3 Command cables - remove and install

Removing and installing the command cable: [page 18](#).



## 4 Service valves - location

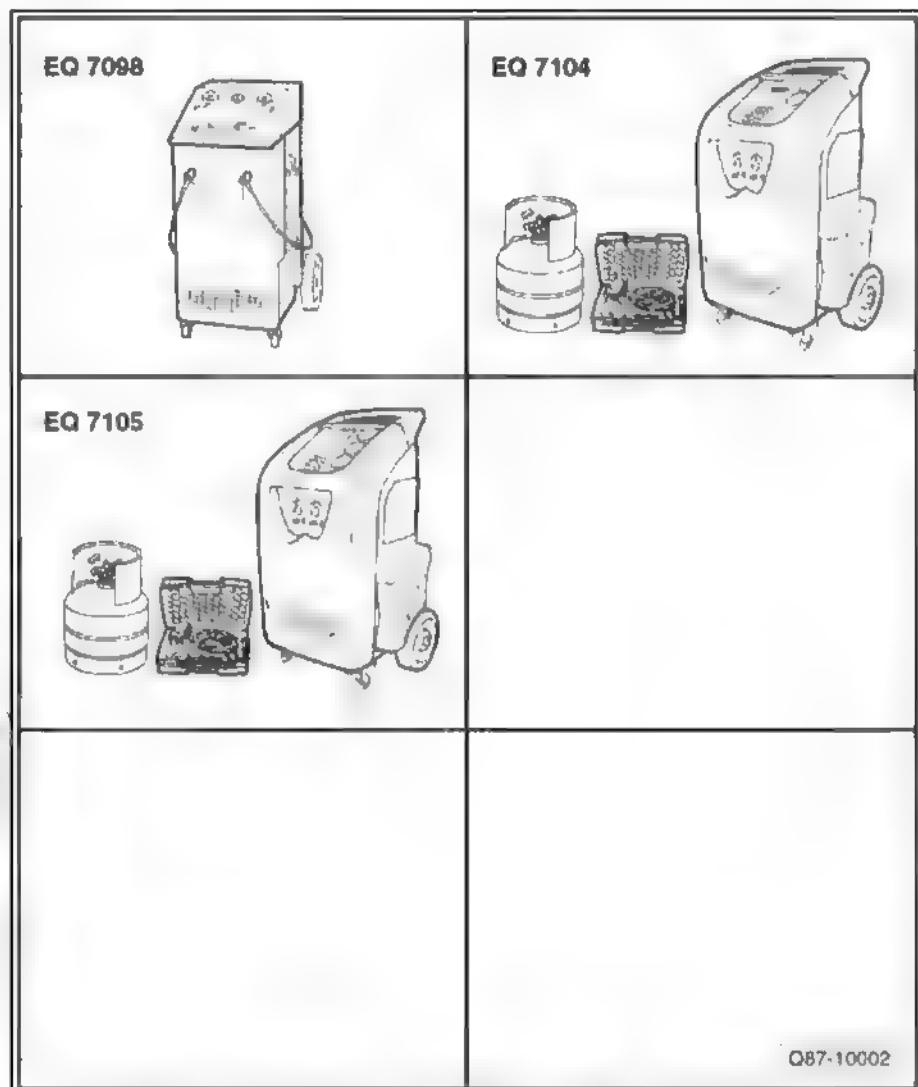


### Note

- ◆ The service valves are located in the engine compartment, at the right side of the vehicle, near the front end.
- ◆ Other available equipment and tools for tests may also be used; refer to ⇒ Air conditioning with R134a refrigerant, Rep. gr. 00 ; Technical data

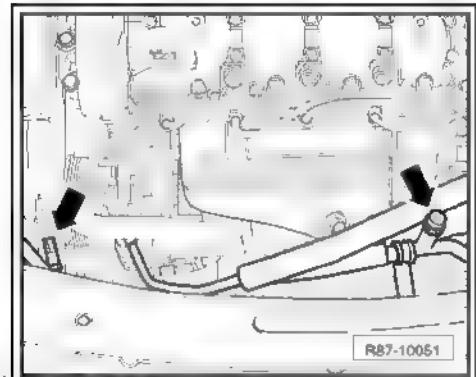
Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7105-





- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas  
⇒ Air conditioning with R134a refrigerant, Rep gr. 00 ; Technical data





## 5 Air conditioning with manual adjustment (Climatic)

### 5.1 Heating and air conditioning - passenger compartment components



#### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- ⇒ Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



#### Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.



**1 - Side air baffles with frame**

- With integrated air baffles for side windows
- Remove and install [page 10](#)

**2 - Demisting baffle**

- Only remove after panel is removed.
- Remove the instrument panel  $\Rightarrow$  Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation

**3 - Air baffles (central)**

- Remove and install [page 11](#)

**4 - Ventilation adjustment mechanism**

- Remove and install [page 15](#)

**5 - Ventilation adjustment mechanism (Europe vehicles only)**

- Remove and install [page 16](#)

**6 - Defogger nozzle**

- Remove and install [page 13](#)

**7 - Right air duct**

- For the right air baffle on the panel  $\Rightarrow$  Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation

**8 - Left air duct**

- For the left air baffle on the panel  $\Rightarrow$  Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation

**9 - Air distributor for baffles**

- Remove and install [page 13](#)

**10 - Dust and pollen filter compartment (Denso Box)**

**11 - Air intake duct (Denso Box)**

**12 - Control motor for natural air valve and recirculation valve -V154- (Denso box)**

- Remove and install [page 43](#)

**13 - Natural air fan -V2- (Denso Box)**

- Remove and install [page 6](#)

**14 - Natural air fan pre-resistance with overheating fuse -N24- (Denso Box)**

- Remove and install [page 8](#)

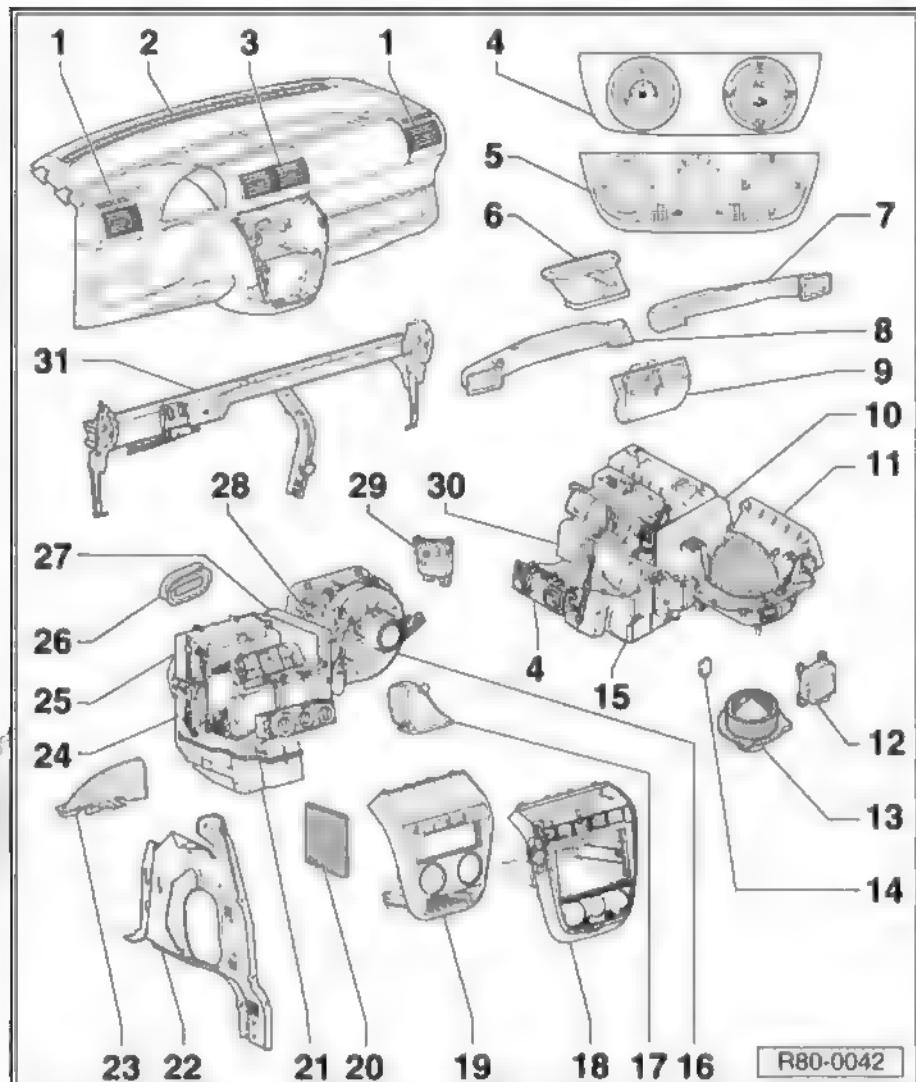
**15 - Heat exchanger compartment (Denso Box)**

**16 - Natural air fan -V2- (Behr box)**

- Remove and install [page 5](#)

**17 - Front right feet air duct**

- Remove and install [page 12](#)





## 18 - Lower central frame (Europe vehicles only)

- Remove and install ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations

## 19 - Lower central frame

- Remove and install ⇒ Body - Internal assembly work, Rep. gr. 70 ; Linings / insulations

## 20 - Dust and pollen filter

- Remove and install (Behr Box) ⇒ [page 8](#)
- Remove and install (Denso box) ⇒ [page 9](#)

## 21 - Heat exchanger compartment (Behr box)

## 22 - Left mounting of transverse support

- Remove and install ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations

## 23 - Front left feet air duct

- Remove and install ⇒ [page 12](#)

## 24 - Plenum chamber (Behr Box)

- Remove and install ⇒ [page 68](#)

## 25 - Evaporator compartment (Behr Box)

## 26 - Sealing

- Replace if damaged
- Note installation position ⇒ [page 64](#)
- Observe the installation position (Europe vehicles only) ⇒ [page 65](#)

## 27 - Dust and pollen filter compartment (Behr Box)

## 28 - Natural air fan pre-resistance with overheating fuse -N24- (Behr Box)

- Remove and install ⇒ [page 7](#)

## 29 - Control motor for natural air valve and recirculation valve -V154- (Behr box)

- Remove and install ⇒ [page 31](#)

## 30 - Plenum chamber (Denso Box)

- Remove and install ⇒ [page 71](#)

## 31 - Cross member

- Remove and install ⇒ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations

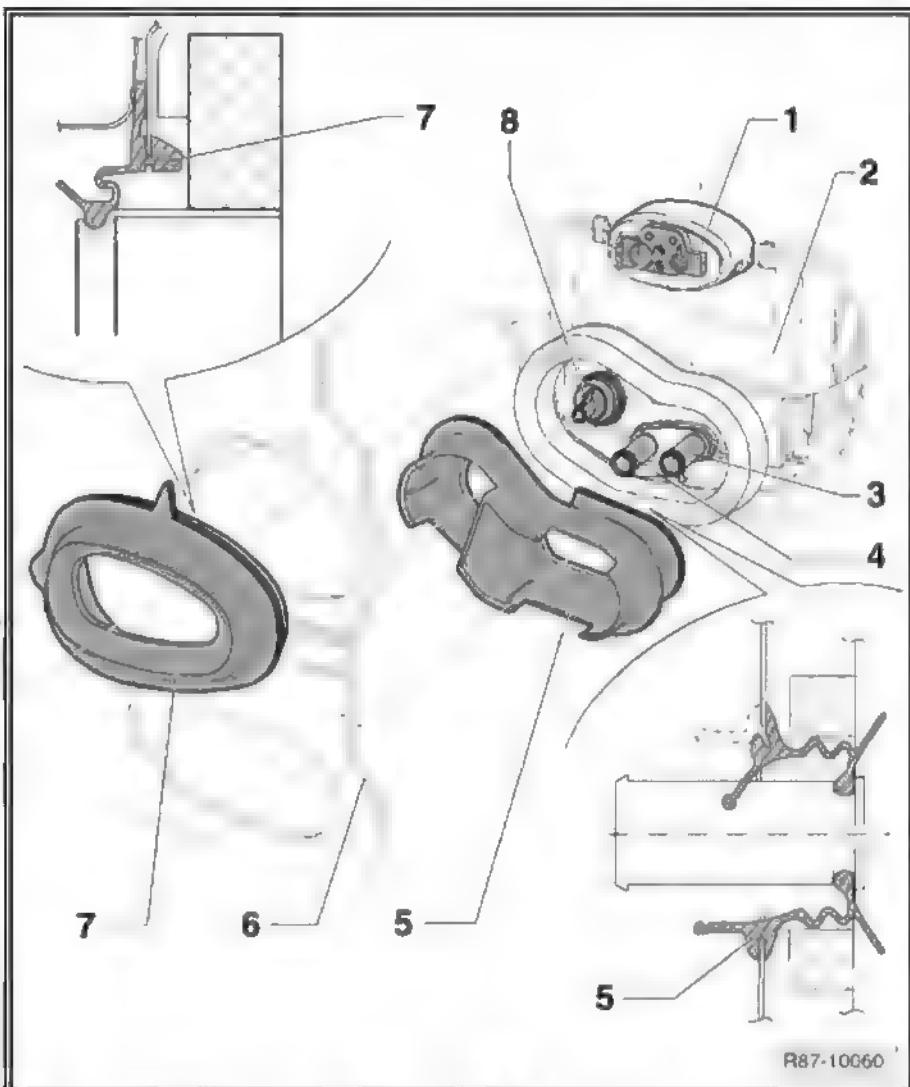
## 5.2 Seals of the engine compartment partition panel

For vehicles equipped with an air conditioning system.

- ◆ Vehicles with ventilation / heating system ⇒ [page 3](#) .



- 1 - Expansion valve
  - Remove and install  
⇒ [page 120](#)
- 2 - Plenum chamber (air conditioning)
- 3 - Heat exchanger intake duct
  - Heat exchanger - remove and install  
⇒ [page 45](#)
- 4 - Heat exchanger outlet duct
  - Heat exchanger - remove and install  
⇒ [page 45](#)
- 5 - Heat exchanger sealing
  - Replace if damaged
- 6 - Engine compartment's partition panel
- 7 - Sealing of expansion valve
  - Replace if damaged
- 8 - Evaporator drainage duct
  - The water output valve must not be blocked or obstructed
  - Check the correct installation position of the seal for the water output valve in the partition panel



### 5.3 Seals of the engine compartment partition panel (Europe vehicles only)

For vehicles equipped with an air conditioning system.

- ◆ Vehicles with ventilation / heating system (Europe vehicles only)  
⇒ [page 4](#).



**1 - Expansion valve**

- Remove and install  
→ [page 120](#)

**2 - Plenum chamber (air conditioning)**

**3 - Heat exchanger**

- Remove and install  
→ [page 45](#)

**4 - Heat exchanger sealing**

- Replace if damaged

**5 - Engine compartment's partition panel**

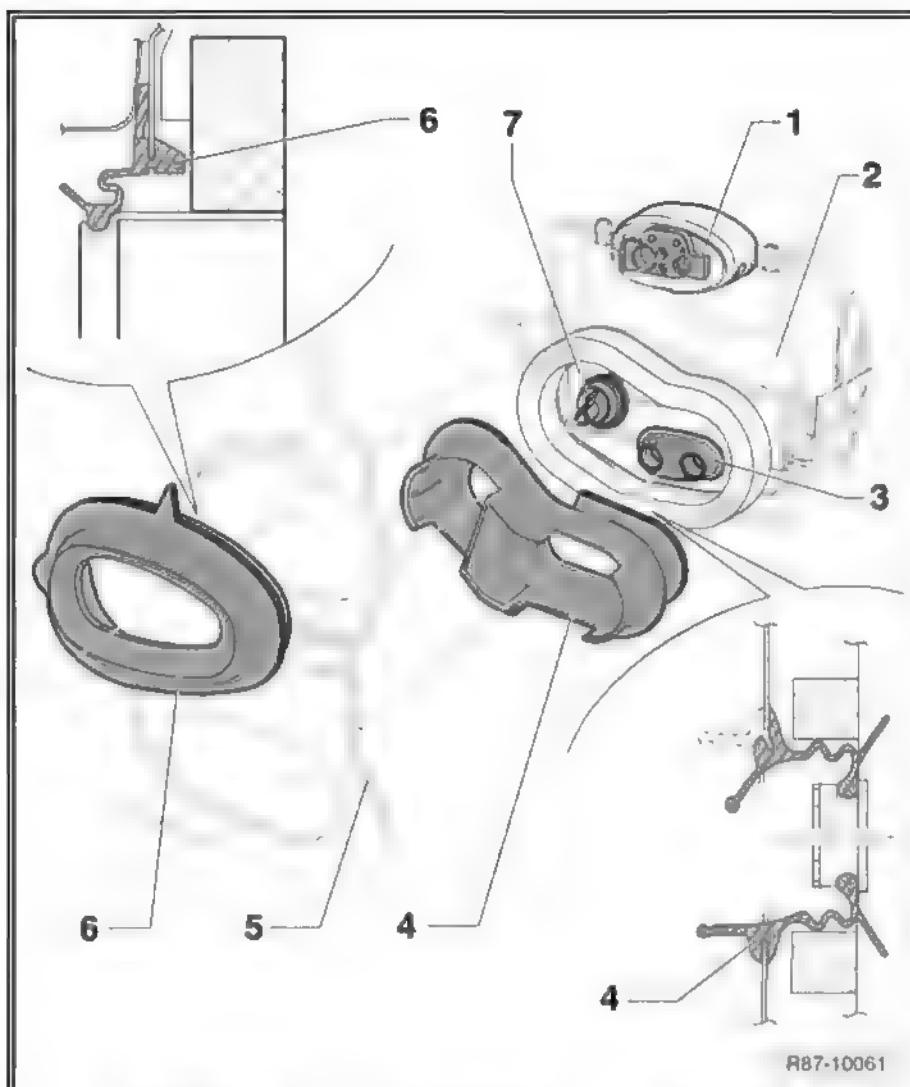
**6 - Sealing of expansion valve**

- Replace if damaged

**7 - Evaporator drainage duct**

- The water output valve must not be blocked or obstructed

- Check the correct installation position of the seal for the water output valve in the partition panel



al purposes in part o



## 6 Plenum chamber (air conditioning) - remove and install



### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- → Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*

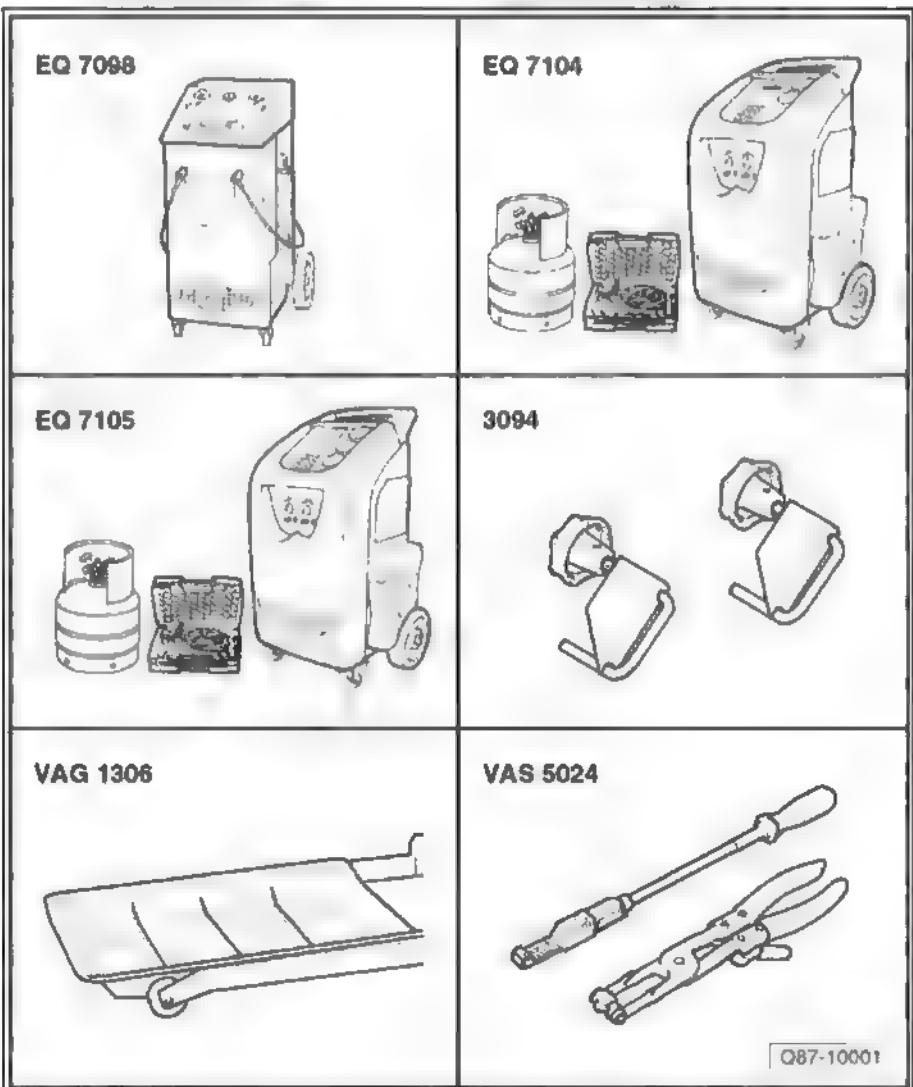


### Note

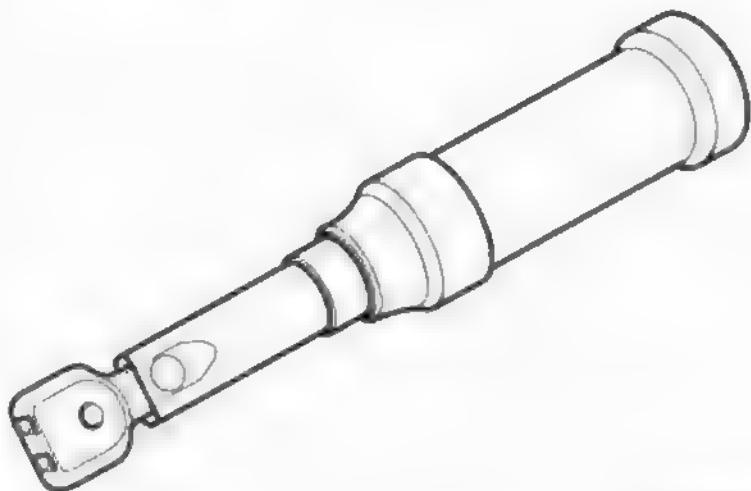
- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.

#### Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7105-
- ◆ Clamps (diameter 25 mm) -3094-
- ◆ Oil collecting tray -VAG 1306-
- ◆ Standard-type clamp pliers -VW 5162 (VWB) - ou - VAS 5024A-



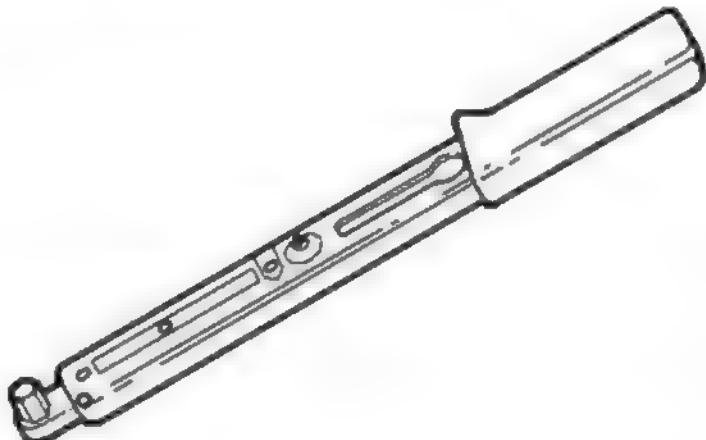
Q87-10001

**V.A.G 1783**

Q00-10085

Torque wrench 2 to 10 Nm -VAG 1783-

- ◆ Torque wrench - 5 to 50 Nm (enc. 1/2") -VAG 1331-

**V.A.G 1331**

Q00-10065

**6.1 Plenum chamber (Behr) - remove and install**

- ◆ Vehicles with Denso plenum chamber [page 71](#) .

Assembly overview:

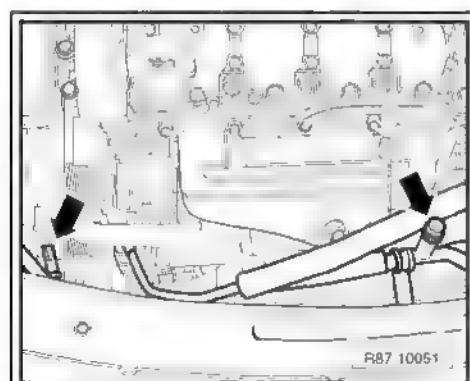


- 1 - Dust and pollen filter
  - Remove and install (Behr Box) ➤ [page 8](#)
- 2 - Screws
  - 2 units
  - 12 Nm
- 3 - Air distribution command cable
  - Remove and install ➤ [page 18](#)
- 4 - Temperature command cable
  - Remove and install ➤ [page 18](#)
- 5 - Heat exchanger
  - Remove and install ➤ [page 45](#)
- 6 - Left mounting of transverse support
  - Remove and install ➤ Body - Internal assembly work; Rep. gr. 70 ; Linings / insulations
- 7 - Screws
  - 2 units
  - 12 Nm
- 8 - Screws
  - 2 units
  - 12 Nm
- 9 - Screws
  - 3 units
  - 5 Nm
- 10 - Heat exchanger/engine compartment partition panel sealing
  - Replace if damaged
  - Note installation position ➤ [page 65](#)
- 11 - Evaporator compartment



### 6.1.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas ➤ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .





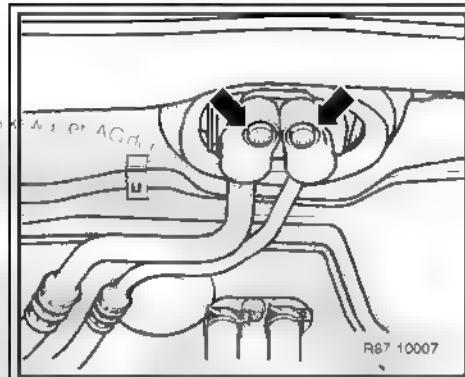
- Loosen the fastening screws -arrows- and remove refrigerant circuit tubing

**WARNING**

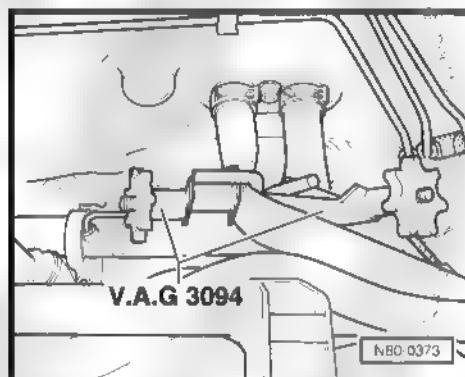
*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C  
Cooling system is pressurized*

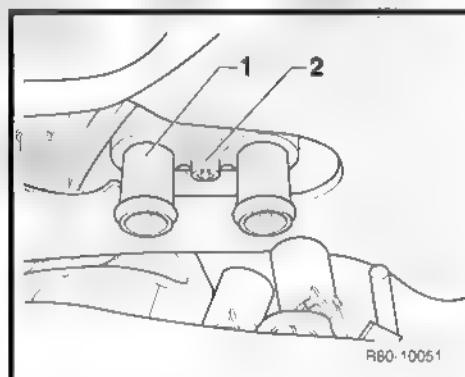
*Before starting any work, reduce pressure and temperature, if required.*



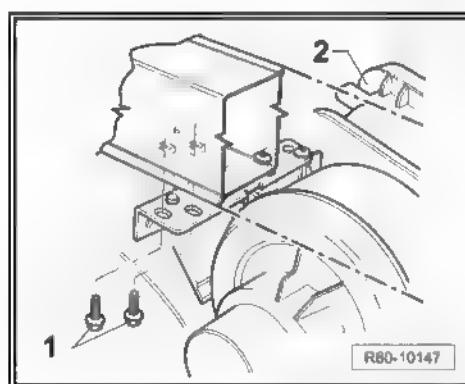
- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-.
- Release clamps with the Standard-type clamp pliers -VW 5162 (VWB) - ou - VAS 5024A- and remove hoses.
- Install a hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.



- Remove screw -2- and flange -1-.
- Turn off the ignition and all electrical equipment, and remove the key from ignition.
- Disconnect the Battery -A- ⇒ Electrical devices: Rep. gr. 27 ; Starter motor, alternator, battery .
- Remove the dash panel ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the direct support for the panel bracket ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .



- Loosen the fastening screws -1- from the plenum chamber -2-.
- Move plenum chamber away from the panel support and release harnesses and connectors fastened to plenum chamber.
- Remove the plenum chamber.



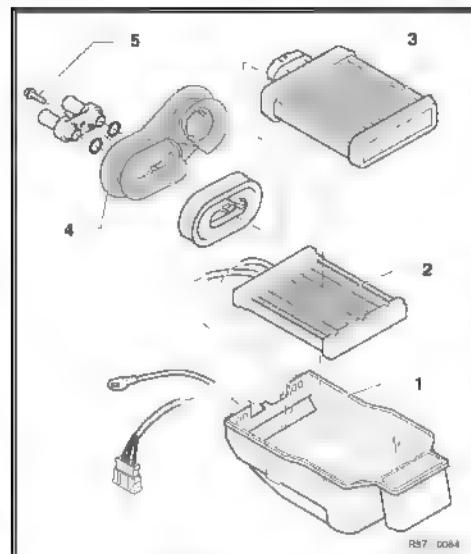
### 6.1.2 Installation

Installation is performed in reverse sequence to the removal, observing the following

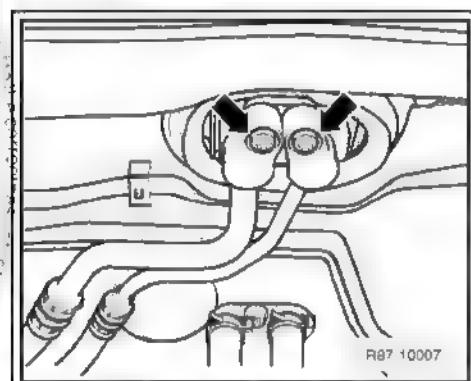
- Mount harnesses and all the connectors in their original positions



- Tighten the flange fastening screw -5- to a (20-Nm) torque.
- Observe seal installation position -4- and heat exchanger hose position [→ page 65](#).



- Tighten the fastening screws -arrows- for the refrigerant circuit to (10 Nm).



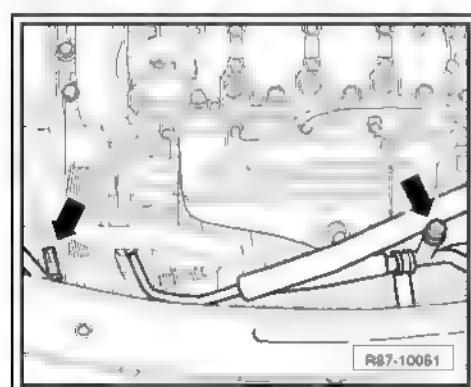
☞ Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ⇒ Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .

- Check the amount of gas supplied [→ page 126](#).



#### Note

*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows:*



- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank , causing coolant level there to decrease).
- Top up coolant tank level ⇒ Engine; Rep. gr. 19 ; Cooling system .

## 6.2 Plenum chamber (Denso) - remove and install

- ◆ Vehicles with Behr plenum chamber [→ page 68](#) .

Assembly overview:



1 - Cross member

- Remove and install →  
Body - Internal assembly works; Rep. gr. 70 ;  
Lining / insulation .

2 - Heat exchanger sealing

- Note installation position [⇒ page 64](#)
- Replace if damaged

3 - Sealing of expansion valve

- Note installation position [⇒ page 64](#)
- Replace if damaged

4 - Screws

- 2 units
- $12 \pm 1.2 \text{ Nm}$

5 - Heat exchanger compartment

- Heat exchanger - remove and install  
[⇒ page 45](#)

6 - Air distribution command cable

- Remove and install  
[⇒ page 18](#)

7 - Left mounting of transverse support

- Remove and install ⇒  
Body - Internal assembly work; Rep. gr. 70 ;  
Linings / insulations

8 - Temperature command cable

- Remove and install [⇒ page 18](#)

9 - Screws

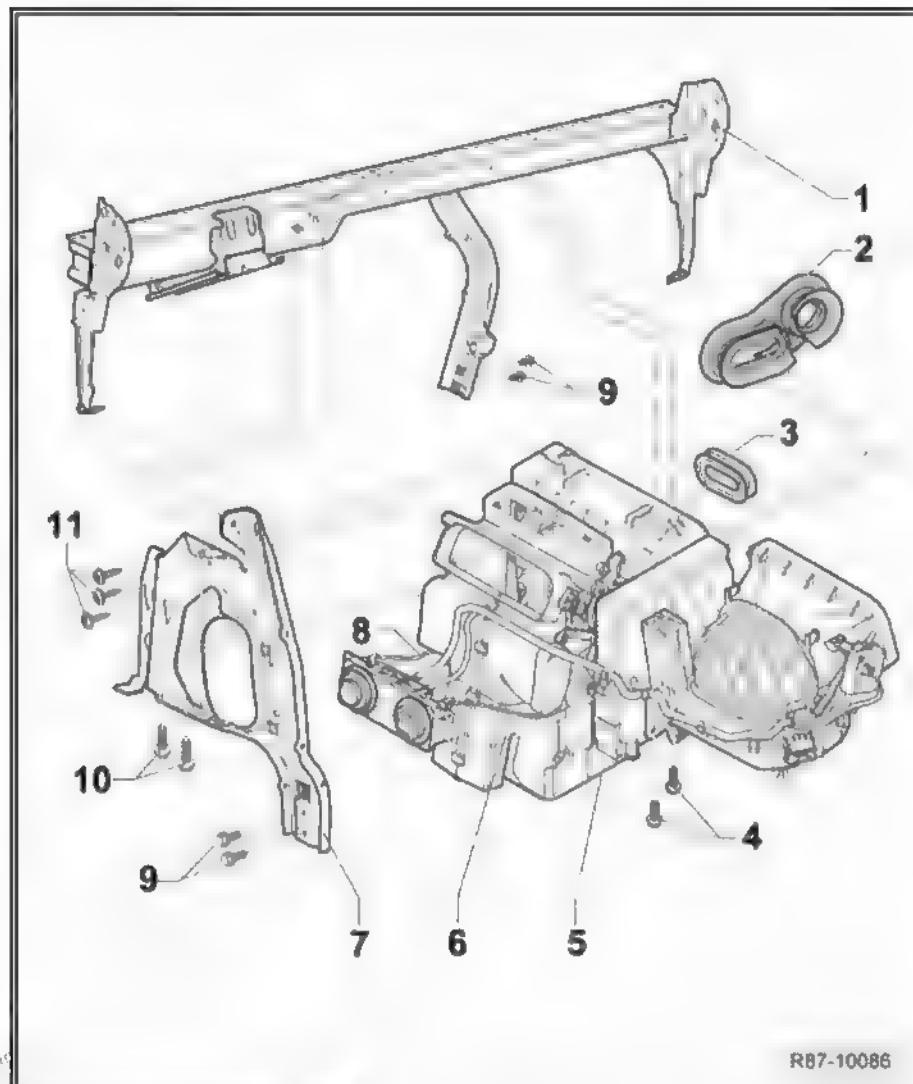
- 4 units
- $12 \pm 1.2 \text{ Nm}$

10 - Screws

- 2 units
- 12 Nm

11 - Screws

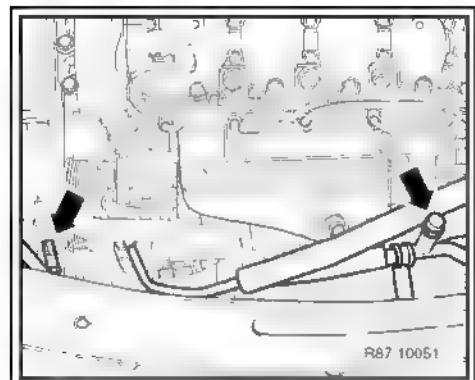
- 3 units
- $5 \pm 0.5 \text{ Nm}$





### 6.2.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas  
⇒ Air conditioning with R134a refrigerant, Rep. gr. 00 ; Technical data



- Loosen the fastening screws -arrows- and remove refrigerant circuit tubing.

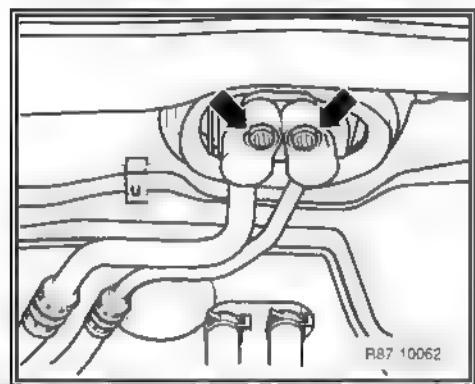


#### WARNING

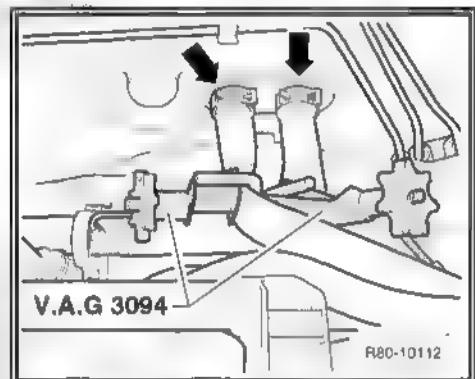
*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C.  
Cooling system is pressurized.*

*Before starting any work, reduce pressure and temperature, if required.*

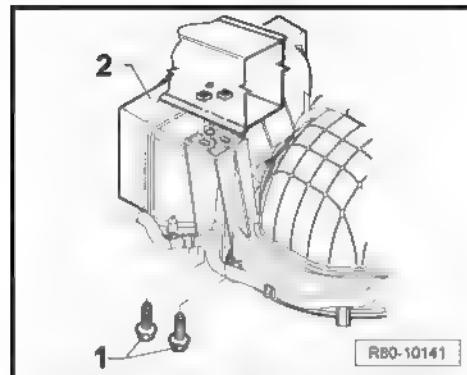


- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-
- Release the clamps -arrows- with the Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A- and remove the hoses.
- Install a hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.
- Turn off the ignition and all electrical equipment, and remove the key from ignition.
- Disconnect the Battery -A- ⇒ Electrical devices; Rep. gr. 27 ; Starter motor, alternator, battery .
- Remove the dash panel ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the direct support for the panel bracket ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .





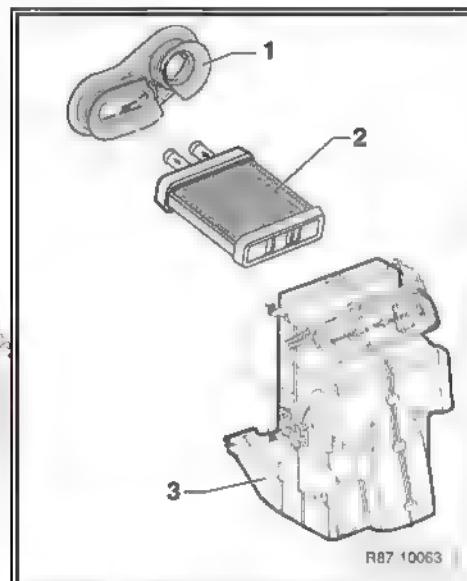
- Loosen the fastening screws -1- from the plenum chamber -2-.
- Move plenum chamber away from the panel support and release harnesses and connectors fastened to plenum chamber.
- Remove the plenum chamber.



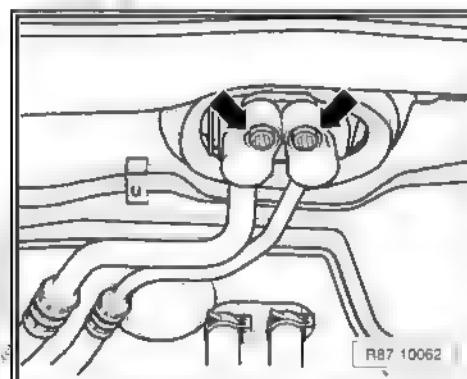
## 6.2.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

- Mount harnesses and all the connectors in their original positions.
- Observe the installation position of the seal -1- and of the hoses on the heat exchanger -2- [⇒ page 64](#).



- Tighten the fastening screws -arrows- for the refrigerant circuit to (10 Nm).



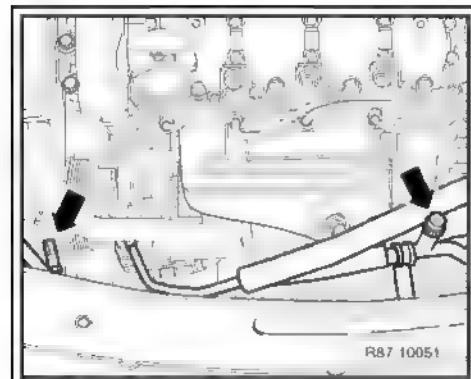


- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas → Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .
- Check the amount of gas supplied → [page 126](#) .



**Note**

*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows:*



- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank , causing coolant level there to decrease).
- Top up coolant tank level → **Engine**; Rep. gr. 19 ; Cooling system .

### 6.3 Evaporator housing (Behr box) - remove and install

- ◆ Vehicles with Denso plenum chamber → [page 78](#) .

1 - Air distributor box in upper part

- Do not remove
- With temperature and air distributor hatch

2 - Lower part of evaporator

3 - Clip

- Remove with high pressure with a screwdriver

4 - Evaporator

5 - Evaporator housing - upper part

6 - Air intake duct housing

- With natural air and circulation air door

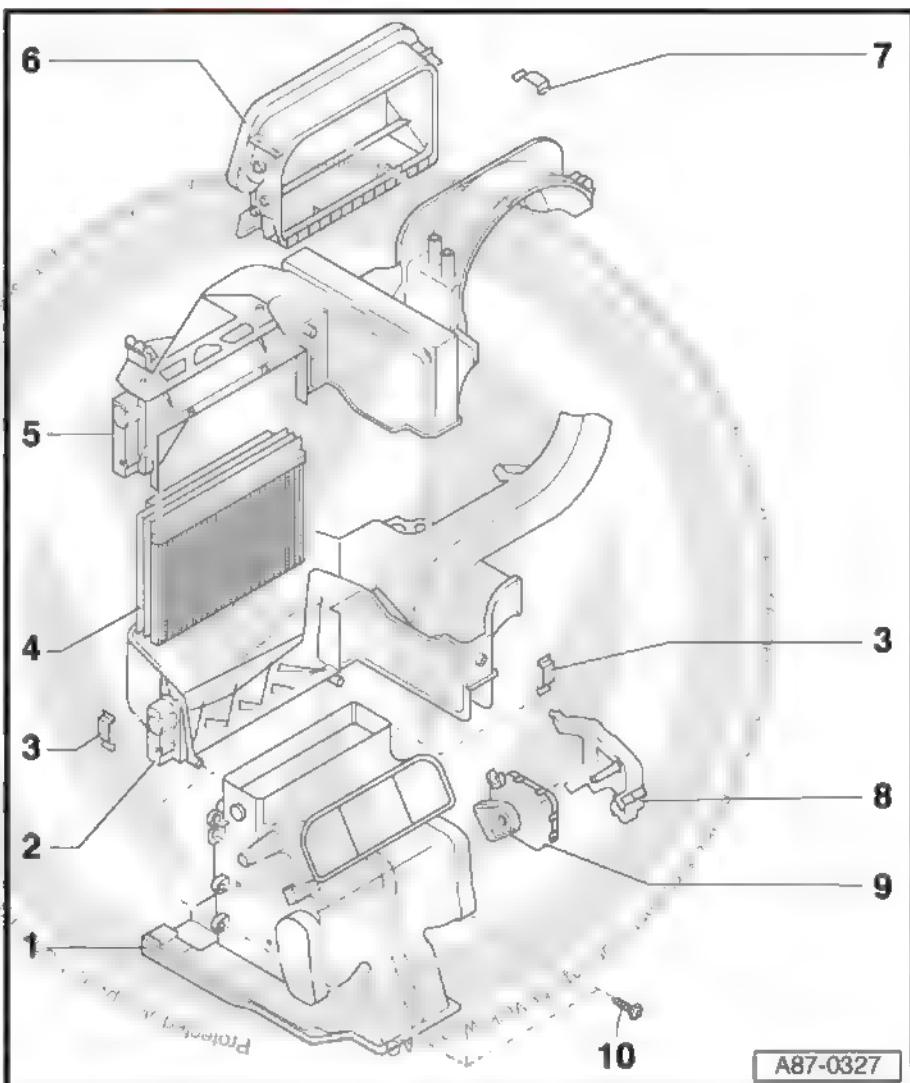
7 - Clip

- Replace if damaged

8 - Support for control motor

9 - Control motor for central door -V70-

- Check: → Vehicle diagnostic tester
- Replace and adjust Code command unit with Diagnosis, measurement and information system -VAS 5051A- or later equipment → General Information; Rep. gr. 97 ; Electric cables and harnesses .

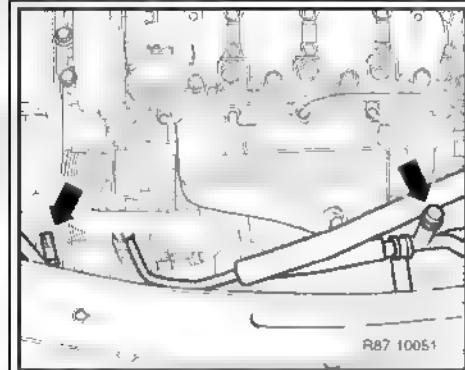




## 10 - Screw

### 6.3.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas  
⇒ Air conditioning with R134a refrigerant, Rep. gr. 00 ; Technical data



- Loosen the fastening screws -arrows- and remove refrigerant circuit tubing.

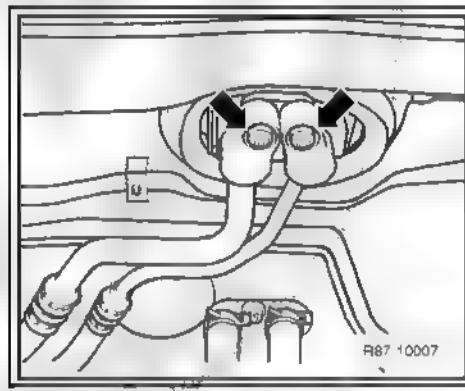


#### WARNING

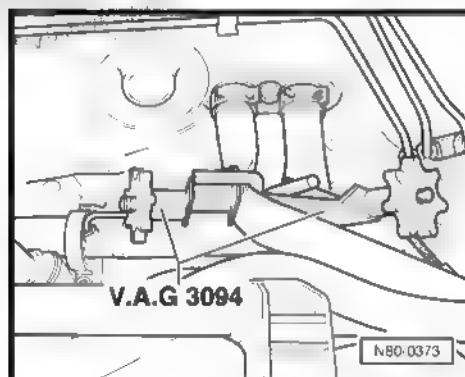
*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C.  
Cooling system is pressurized.*

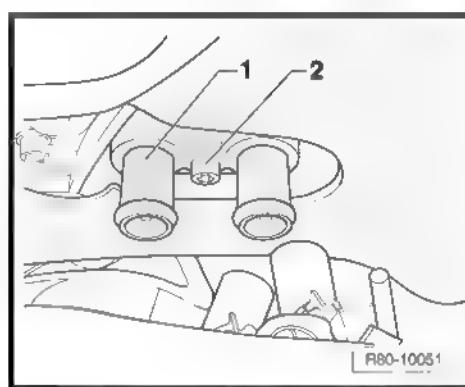
*Before starting any work, reduce pressure and temperature, if required.*



- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-
- Release clamps with the Standard-type clamp pliers -VW 5162 (VWB) - ou - VAS 5024A- and remove hoses.
- Install a hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.



- Remove screw -2- and flange -1-.
- Turn off the ignition and all electrical equipment, and remove the key from ignition.
- Disconnect the Battery -A- ⇒ Electrical devices; Rep. gr. 27 ; Starter motor, alternator, battery .
- Remove the dash panel ⇒ Body - Internal assembly works, Rep. gr. 70 ; Lining / insulation .
- Remove the direct support for the panel bracket ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the remaining fastening screws.



Before removing the housing, remove the evaporator, the heat exchanger and the expansion valve connections.

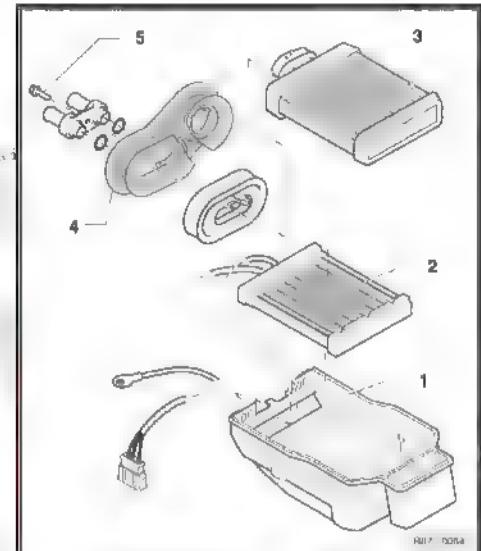
- Remove the heater and cooling equipment



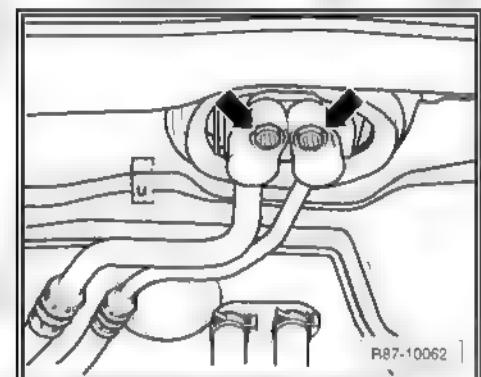
### 6.3.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

- Mount harnesses and all the connectors in their original positions.
- Tighten screw -5- to 20 Nm.
- Observe the installation position of the seal -4- and of the hoses on the heat exchanger -3- ⇒ [page 65](#).



- Tighten the fastening screws -arrows- for the refrigerant circuit to (10 Nm).

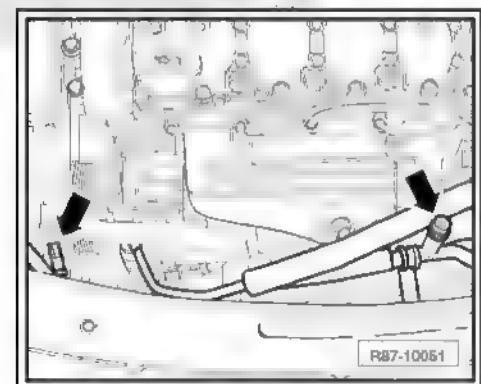


- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ⇒ Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .
- Check the amount of gas supplied ⇒ [page 126](#).



#### Note

*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows.*



- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank , causing coolant level there to decrease).
- Top up coolant tank level ⇒ Engine; Rep. gr. 19 ; Cooling system .



## 6.4 Evaporator housing (Denso box) - remove and install

◆ Vehicles with Behr plenum chamber [⇒ page 75](#).

### 1 - Sealing

Replace if damaged

### 2 - Air distributor box in upper part

Do not remove

With temperature and air distributor hatch

### 3 - Control motor for natural air valve and recirculation valve - V154-

Remove and install  
[⇒ page 31](#)

### 4 - Air distributor box in lower section

### 5 - Clip

Replace if damaged

### 6 - Natural air fan -V2- (Denso Box)

Remove and install  
[⇒ page 8](#)

### 7 - Clip

Replace if damaged

### 8 - Natural air fan pre-resistor with overheating fuse -N24-

Remove and install  
(Denso box) [⇒ page 8](#)

### 9 - Heating equipment harnesses

### 10 - Dust and pollen filter

Remove and install  
[⇒ page 9](#)

### 11 - Air distribution command cable

Remove and install [⇒ page 18](#)

### 12 - Temperature command cable

Remove and install [⇒ page 18](#)

### 13 - Air distributor chamber

### 14 - Screw

1,5 Nm

### 15 - Evaporator

### 16 - Heat exchanger

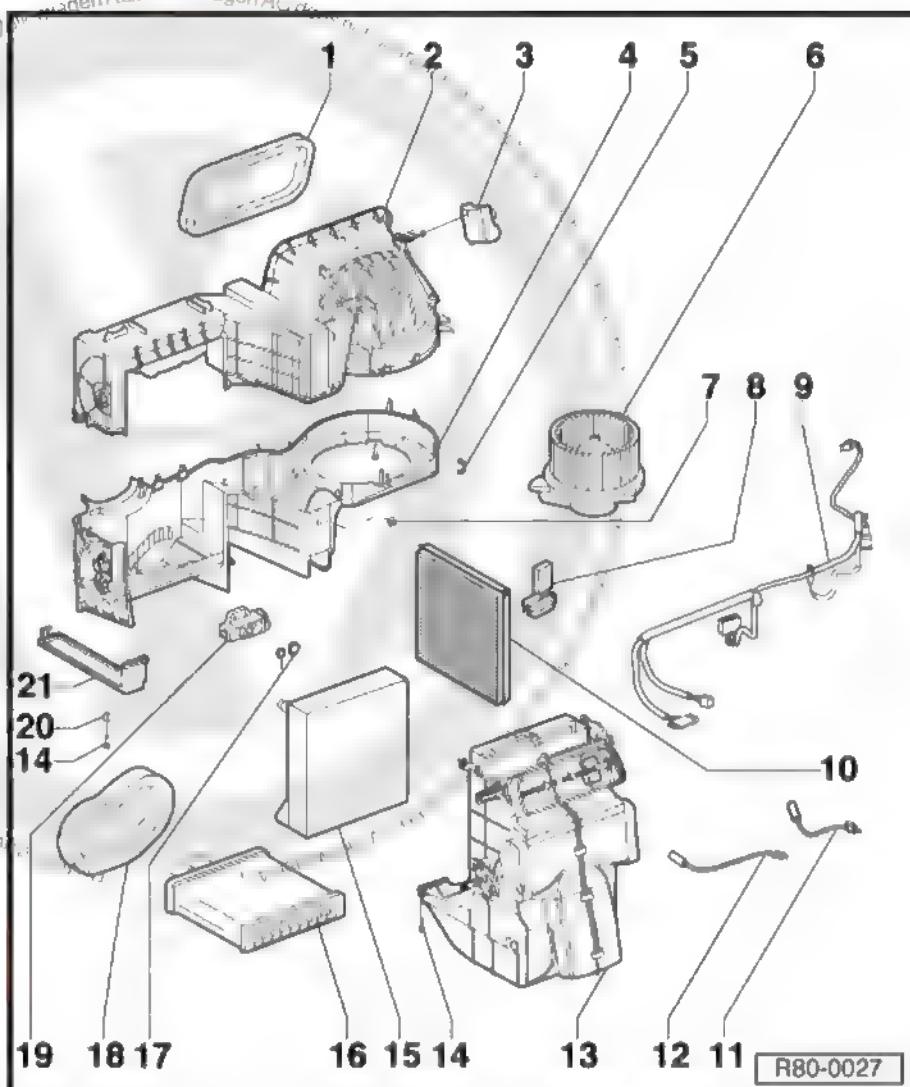
Remove and Install [⇒ page 45](#)

### 17 - Sealing rings

Replace

### 18 - Heat exchanger sealing

Replace if damaged





19 - Expansion valve

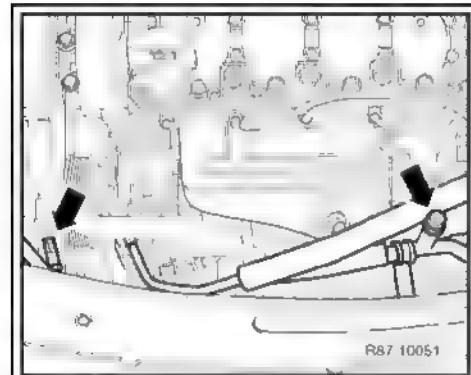
- Remove and Install → [page 120](#)

20 - Bushing

21 - Dust and pollen filter cover

#### 6.4.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas  
⇒ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .



- Loosen the fastening screws -arrows- and remove refrigerant circuit tubing.

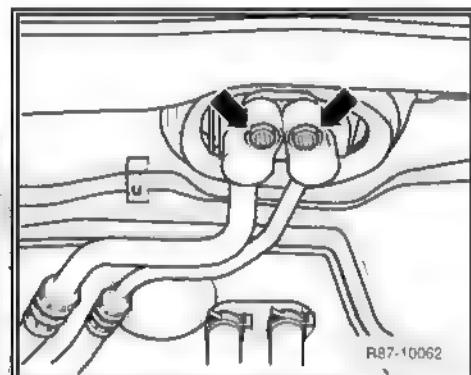


#### WARNING

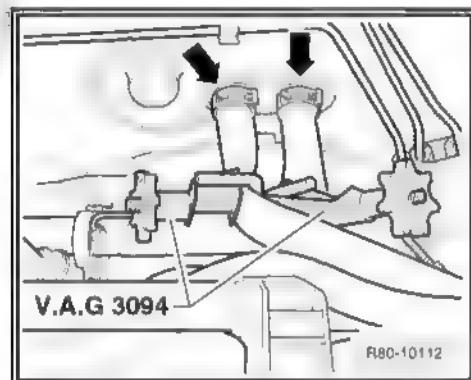
*Risk of burns!*

*With hot engine, the coolant temperature may be over 100°C.  
Cooling system is pressurized.*

*Before starting any work, reduce pressure and temperature, if required.*



- Close the coolant hoses in engine compartment by using the Clamps (diam. 25 mm) -3094-
- Release the clamps -arrows- with the Standard-type clamp pliers -VW 5162 (VWB) - ou - VAS 5024A- and remove the hoses.
- Install a hose on one of the heat exchanger outlets. At the other outlet, place a container to collect coolant.
- Use a compressed air pistol to remove the coolant from the heat exchanger.
- Turn off the ignition and all electrical equipment, and remove the key from ignition.
- Disconnect the Battery -A- ⇒ Electrical devices; Rep. gr. 27 ; Starter motor, alternator, battery .
- Remove the dash panel ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the direct support for the panel bracket ⇒ Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation .
- Remove the remaining fastening screws.



Before removing the housing, remove the evaporator, the heat exchanger and the expansion valve connections.

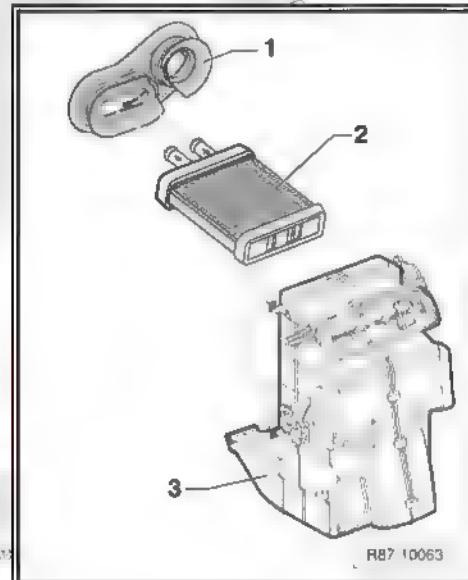
- Remove the heater and cooling equipment.



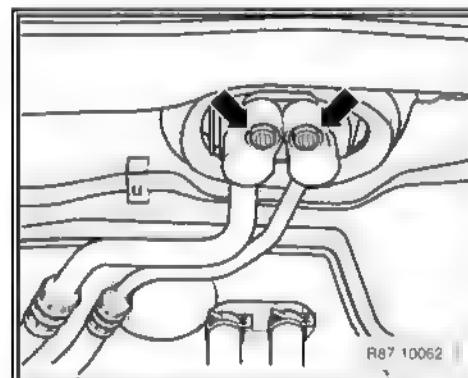
## 6.4.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

- Mount harnesses and all the connectors in their original positions
- Observe the installation position of the seal -1- and of the hoses on the heat exchanger -2- [page 64](#).



- Tighten the fastening screws -arrows- for the refrigerant circuit to (10 Nm).

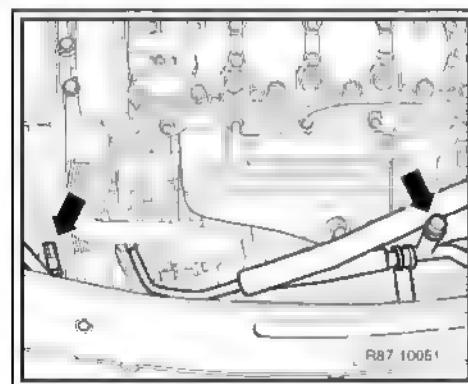


- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas  $\Rightarrow$  Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .
- Check the amount of gas supplied [page 126](#) .



*After removal or replacement of heat exchanger, cooling system will have air; to remove air, proceed as follows:*

- Start the engine and keep it at 2500 rpm speed until coolant level in tank lowers due to opening of thermostat valve (the air that was in the heat exchanger is moved to the coolant tank , causing coolant level there to decrease).
- Top up coolant tank level  $\Rightarrow$  Engine; Rep. gr. 19 ; Cooling system .



## 6.5 Heating and air conditioning equipment (Behr box) - remove and install



1 - Heating equipment harnesses

2 - Evaporator housing in upper part

- Remove and install  
⇒ [page 75](#)

3 - Support

- Fastened to transverse support and heating equipment

4 - Natural air fan pre-resistor with overheating fuse -N24-

- Remove and install  
⇒ [page 7](#)

5 - Sealing

- Replace if damaged
- Note installation position ⇒ [page 4](#)

6 - Expansion valve

- Remove and install  
⇒ [page 120](#)

7 - Air intake duct housing

- With smaller natural air and circulation air door

8 - Sealing

- Replace if damaged

9 - Dust and pollen filter

- Remove and install  
⇒ [page 8](#)

10 - Control motor for natural air and air circulation valve - V154-

- Check ⇒ Vehicle diagnostic tester
- Replace and adjust: Code command unit with Diagnosis, measurement and information system -VAS 5051A- or later equipment ⇒ General Information; Rep. gr. 97 ; Electric cables and harnesses .

11 - Support

12 - Natural air fan -V2- (Behr Box)

- Remove and install ⇒ [page 5](#)
- Check ⇒ [page 5](#)

13 - Housing for natural air fan

14 - Evaporator in lower part

15 - Dust and pollen filter cover

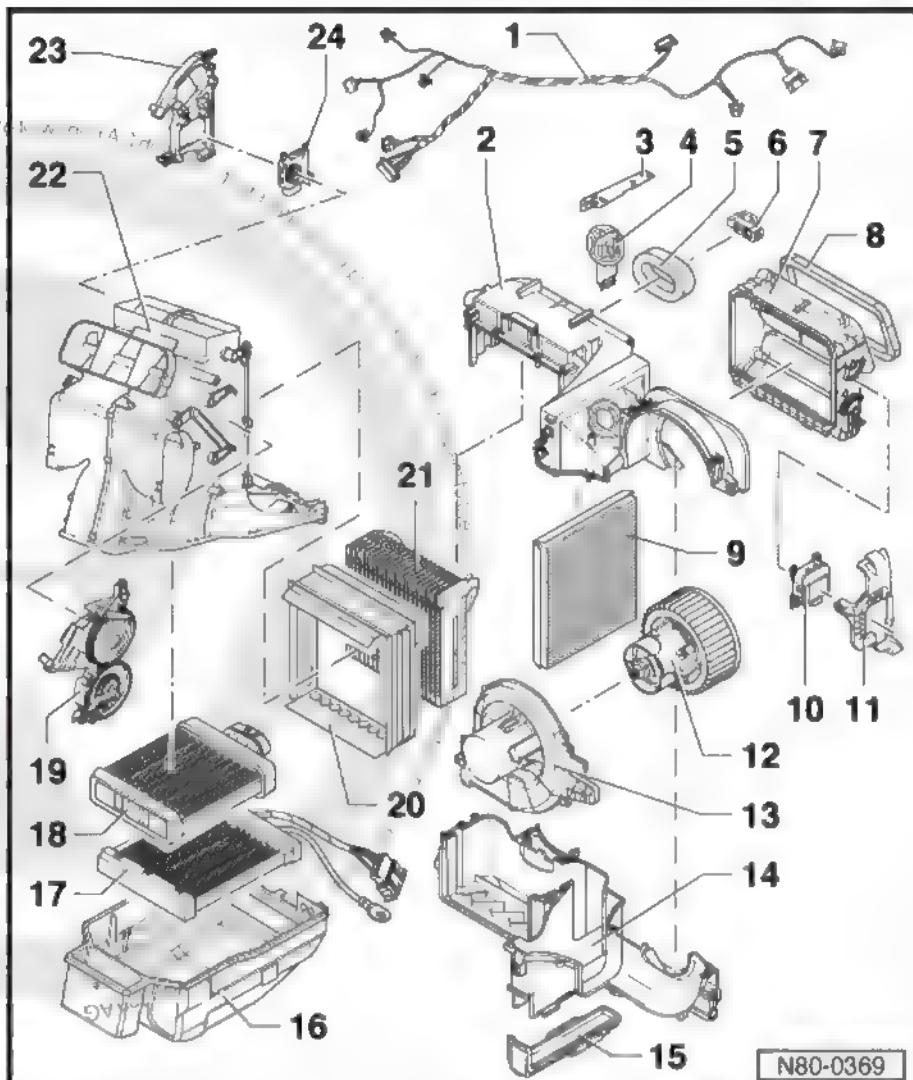
16 - Air distributor box in lower section

17 - Additional heating resistance -Z35-

- Diesel engine vehicles only
- Remove and install ⇒ [page 33](#)
- Check ⇒ [page 34](#)

18 - Heat exchanger

- Remove and Install ⇒ [page 45](#)



N80-0369



19 - Ventilation system adjustment mechanism

- Remove and install [page 29](#)

20 - Sealing for the evaporator

- Observe the following indication for installation or installation position: Lower opening for water output

21 - Evaporator

- Remove and install [page 75](#)

22 - Air distributor box in upper part

23 - Support

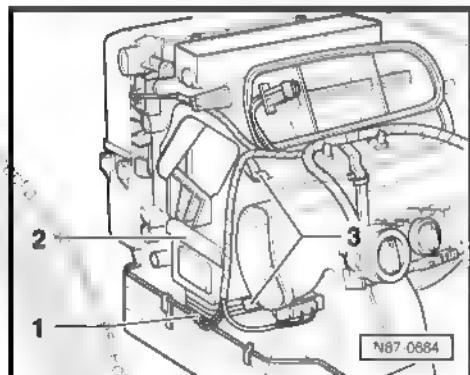
24 - Control motor for temperature adjustment valve -V68-

- Check:  $\Rightarrow$  Vehicle diagnostic tester
- Replace and adjust Housing encoding with Diagnosis, measurement and information system -VAS 5051A- or later equipment  $\Rightarrow$  General Information; Rep. gr. 97 ; Electric cables and harnesses .
- Remove and install [page 82](#)

## 6.6 Control motor for temperature adjustment valve -V68- - remove and install

### 6.6.1 Removal

- Remove the instrument panel  $\Rightarrow$  Body - Internal assembly works; Rep. gr. 70 ; Lining / insulation
- Remove front left feet air duct [page 12](#) .
- Remove front right feet air duct [page 12](#) .
- Remove the left transverse support for the panel bracket  $\Rightarrow$  Body - Internal assembly work; Rep. gr. 70 ; Lining / insulation .
- Remove power connector -1-.
- Press locks -3- slightly forward.
- Disengage and remove the Control motor for temperature adjustment valve -V68- -2- with the support.



### 6.6.2 Installation

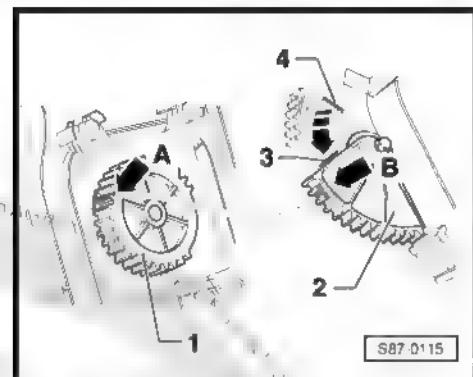


Note

A new Control motor for temperature adjustment valve -V68- is supplied in the "temperature small door closed" position.



- Mark upper and lower stops -4 and 3- on the plenum chamber.
- Adjust the gear segment -2- at the lower stop -3-.
- Mark "short" toothed side-A- in the Control motor for temperature adjustment valve -V68- - 1-.
- Mark the "shorter" teeth-B- on the toothed segment -2-laterally.
- Press the support with the Control motor for temperature adjustment valve -V68- on the case, in order that the tooth -A- engages in slot -B-.
- Connect the connector.
- Start ignition and check operation of the Control motor for temperature adjustment valve -V68- by turning the temperature regulator.

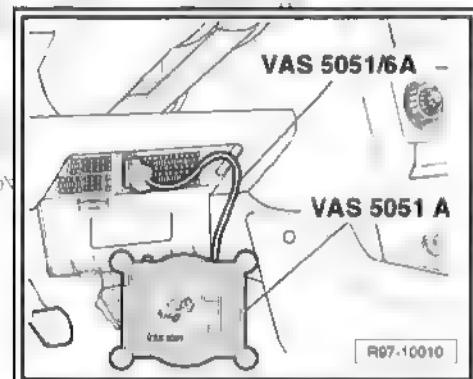


#### Note

- ◆ *The small temperature door must move freely and without jerking movements between its final positions .*
- ◆ *Turn the ignition off immediately if the system malfunctions and repeat the installation.*
- Check the operation with the Diagnosis, Measurement and Information System -VAS 5051A- [= page 83](#) .

## 6.7 Control motor for temperature adjustment valve -V68- - check

- Connect Diagnosis, measurement and information system - VAS 5051A- or later equipment. General Information; Rep. gr. 97 ; Electric cables and harnesses .
- Proceed by selecting the desired functions  $\Rightarrow$  Vehicle diagnostic tester.



## 6.8 Refrigerant gas loop (engine compartment) - Mechanics



#### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A-  $\Rightarrow$  Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery .*



**Note**

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.
- ◆ Only components identified with an asterisk (\*) may be replaced without opening and suction.

1 - High pressure sensor -G65- (\*)

- Remove and install [⇒ page 87](#)
- Replacement of the sealing rings (note number of parts)
- 8 Nm

2 - Service valve

- Environmental contamination by the cooling gas is a punishable offense
- Low pressure side

3 - Cables support (\*)

4 - Air intake opening (\*)

- Under the windscreens covering in lower area

5 - Expansion valve housing

- Replace if damaged

6 - Expansion valve

- Remove and install [⇒ page 120](#)

7 - Water outlet valve (\*)

- Check [⇒ page 64](#)

8 - Heat exchanger chamber

- Replace if damaged

9 - Hose

- High pressure
- From fluid tank to evaporator

10 - Hose

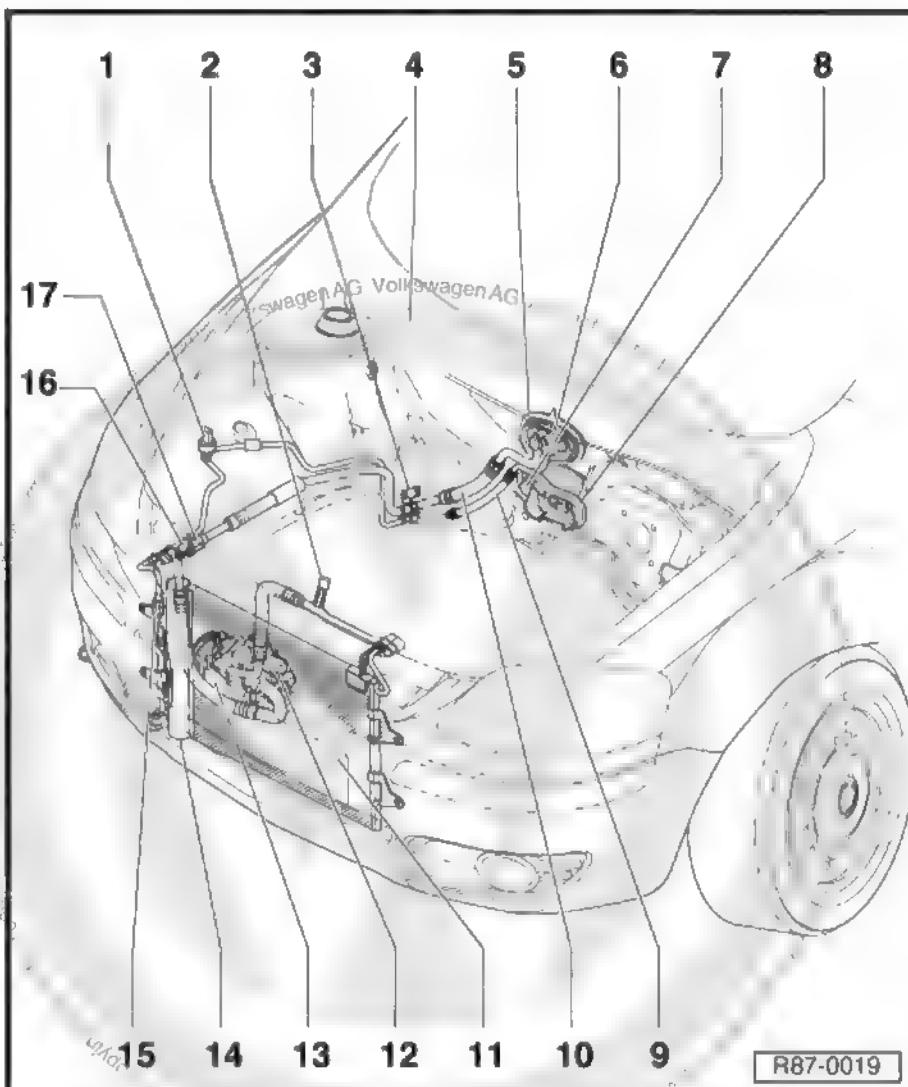
- Low pressure
- From evaporator to compressor

11 - Condenser

- Remove and install [⇒ page 116](#)

12 - Pressure relief valve

- Check [⇒ page 88](#)





#### 13 - Compressor

- Remove and install [page 113](#)
- Observe notes for replacing the compressor [page 115](#)

#### 14 - Fluids tank

#### 15 - Quick-release coupling

- Remove and install [page 122](#)
- High pressure side

#### 16 - Service valve

- Environmental contamination by the cooling gas is a punishable offense
- High pressure side

#### 17 - Quick-release coupling

- Remove and install [page 122](#)
- Low pressure side

### 6.9 Refrigerant gas loop (engine compartment) - Climatic



#### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery-A- ⇒ Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



#### Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.
- ◆ When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.
- ◆ Only components identified with an asterisk (\*) may be replaced without opening and suction.



1 - High pressure sensor -G65-  
(\*)

- Remove and install  
⇒ [page 87](#)
- Replacement of the sealing rings (note number of parts)
- 8 Nm

2 - Service valve

- Environmental contamination by the cooling gas is a punishable offense
- Low pressure side

3 - Cables support (\*)

4 - Air intake opening (\*)

- Under the windscreens covering in lower area

5 - Expansion valve housing

- Replace if damaged

6 - Expansion valve

- Remove and install  
⇒ [page 120](#)

7 - Water outlet valve (\*)

- Check ⇒ [page 64](#)

8 - Heat exchanger chamber

- Replace if damaged

9 - Hose

- High pressure.
- From fluid tank to evaporator

10 - Hose

- Low pressure
- From evaporator to compressor

11 - Condenser

- Remove and install ⇒ [page 116](#)

12 - Pressure relief valve

- Check ⇒ [page 88](#)

13 - Compressor

- Remove and install ⇒ [page 115](#)
- Observe notes for replacing the compressor ⇒ [page 115](#)

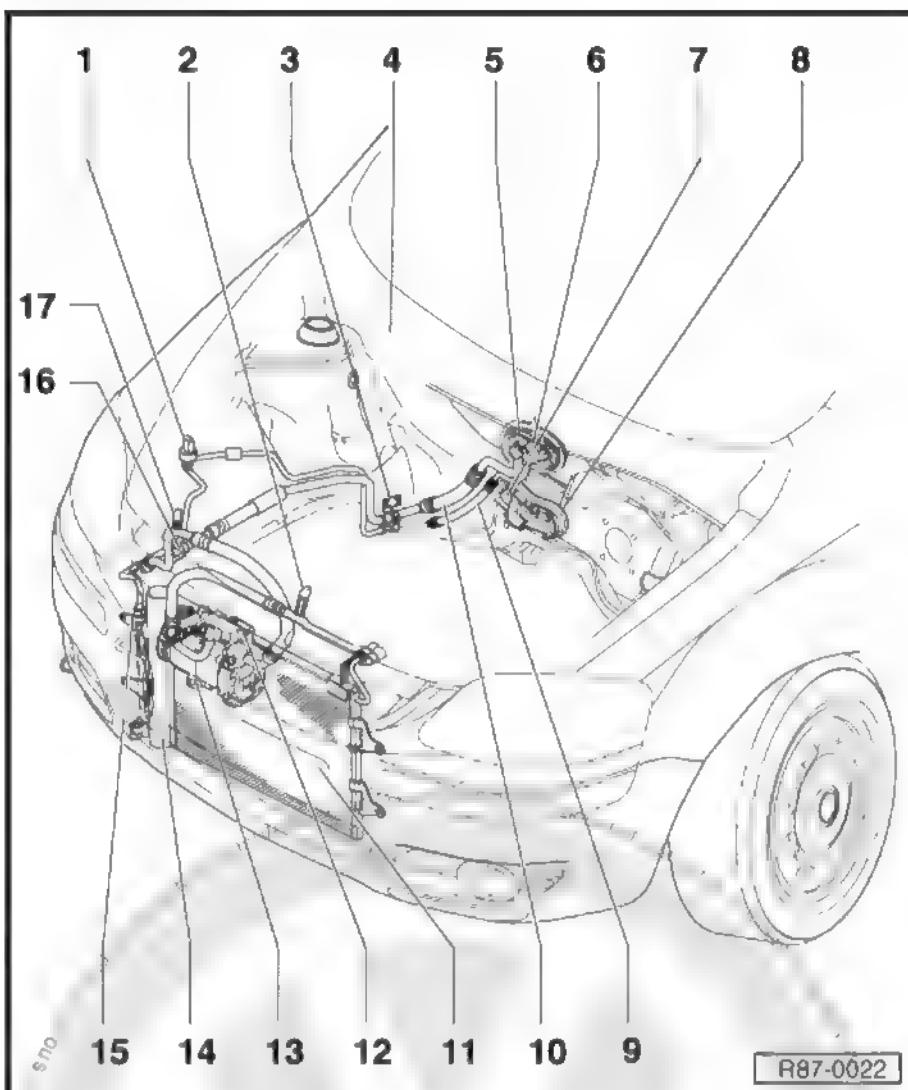
14 - Fluids tank

15 - Quick-release coupling

- Remove and install ⇒ [page 122](#)
- High pressure side

16 - Quick-release coupling

- Remove and install ⇒ [page 122](#)
- Low pressure side



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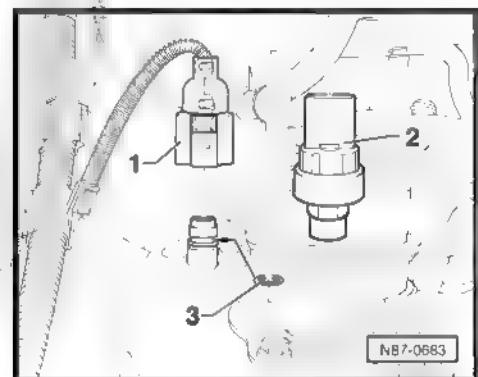
## 17 - Service valve

- Environmental contamination by the cooling gas is a punishable offense
- High pressure side

### 6.10 High pressure sensor -G65- - remove and install

#### 6.10.1 Removal

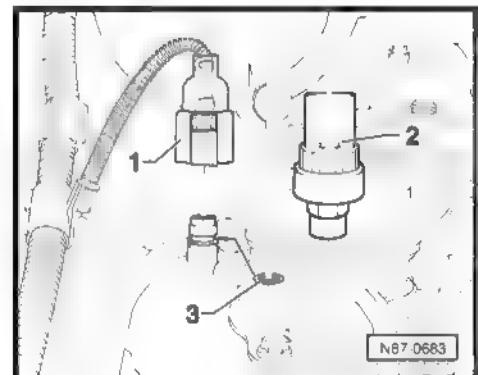
- Remove power connector -1-.
- Unscrew and remove the High pressure sensor -G65- -2-.



#### 6.10.2 Installation

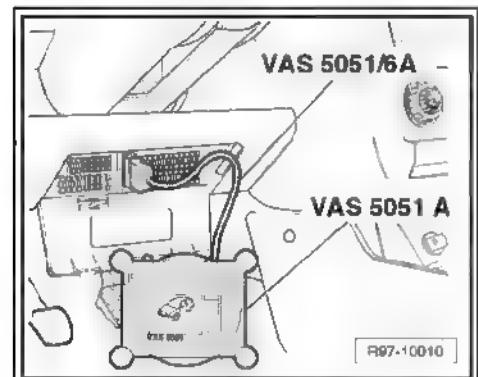
Installation is performed in reverse sequence to the removal, observing the following:

- Replace the sealing ring -3-.
- Tighten the High pressure sensor -G65- to a (8 Nm) torque.



### 6.11 High pressure sensor -G65- - check

- Connect Diagnosis, measurement and information system - VAS 5051A- or later equipment ⇒ General Information; Rep. gr. 97, Electric cables and harnesses
- Proceed by selecting the desired functions ⇒ Vehicle diagnostic tester.

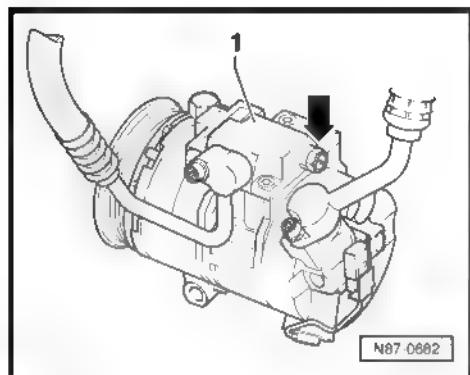




## 6.12 Pressure relief valve in the compressor - check

Check the pressure relief valve on compressor:

- ◆ Valve opening pressure ( $40 \pm 4$  bar)
- ◆ Valve closing pressure (31 bar).
- ◆ The activation (opening) of the overpressure valve can be checked by the presence of refrigerant lubricant in the area adjacent to the valve -arrow-.

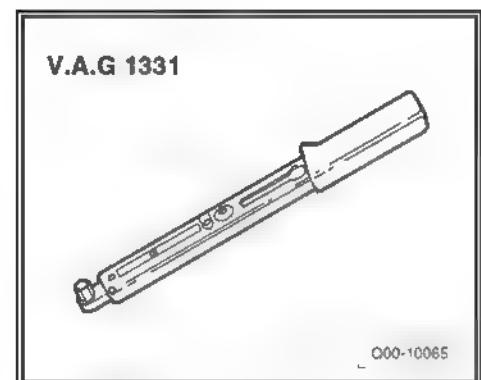




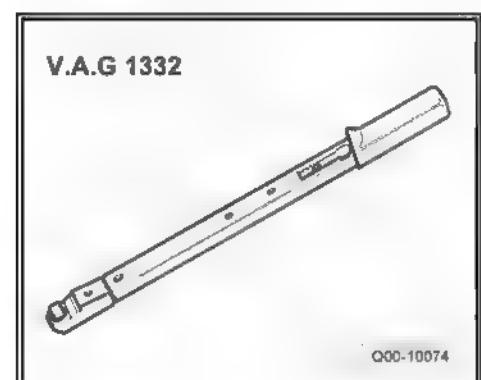
## 7 Air conditioner compressor support

Special tools and workshop equipment required

- ◆ Torque wrench - 5 to 50 Nm ( enc. 1/2") -VAG 1331-



- ◆ Torque wrench 40 - 200 Nm -VAG 1332-



### 7.1

Air conditioning compressor support for 1.0 liters (BNX, CCNA) and 1.6 liters (BPA, CCRA, CFZA) engines - remove and install



#### Note

- ◆ The compressor support and respective components can be removed and installed without the need for opening the refrigerant circuit.
- ◆ To remove and install the Poly-V belt (elastic): ⇒ Engine; Rep. gr. 13 ; Crankshaft, pistons .



### 1 - Compressor support

#### Removal:

- Remove the power steering pump and set it aside  $\Rightarrow$  Chassis, Axles, Steering; Rep. gr. 48 ; Steering .
- Remove the Generator (alternator) -C-  $\Rightarrow$  Electrical system; Rep. gr. 27 ; Starter, alternator, battery .
- Remove compressor from support and fasten it to body  
 $\Rightarrow$  Item 5 (page 90) .
- Remove the screws  $\textcircled{2}$  and remove the cylinder block support -1-.

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Install the fastening screws -2- tightening them in cross pattern with a  
 $\Rightarrow$  Item 2 (page 90) torque.

#### 2 - Screws

- 4 units
- $50 \pm 2.5$  Nm

#### 3 - Cooling system hoses

#### 4 - Screws

- 3 units
- $23 \pm 2.3$  Nm

#### 5 - Compressor

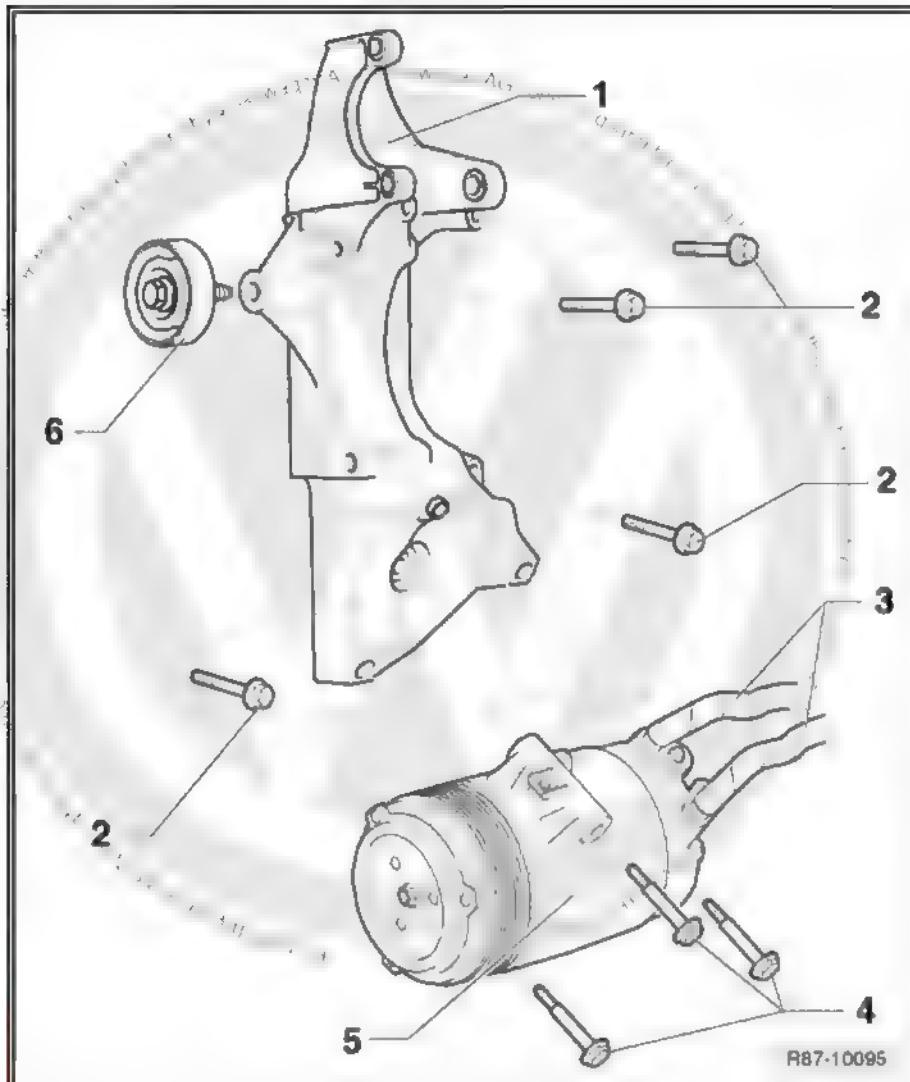
#### Removal:

- Remove Poly-V (elastic) belt  $\Rightarrow$  Engine; Rep. gr. 13 ; Crankshaft, pistons .
- Remove fastening screws -4-  $\Rightarrow$  Item 4 (page 90) .
- Remove compressor from support and fasten it to body  $\Rightarrow$  page 91

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten the compressor fastening screws -4- with a  $\Rightarrow$  Item 4 (page 90) torque
- Check Poly-V belt travel  $\Rightarrow$  page 91 .





**Note**

*In the event the compressor needs to be completely removed, see [→ page 113](#)*

6 - Idler roller.

□  $45 \pm 4.5$  Nm

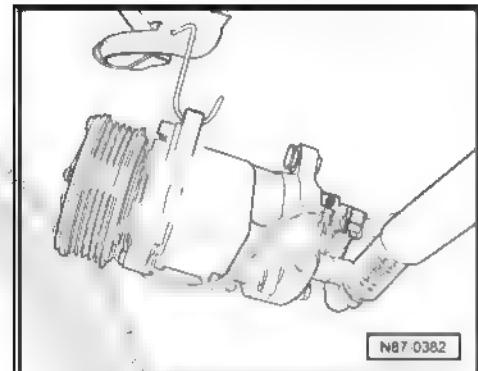
**Fastening the air conditioner compressor to the body:**

If the air conditioning compressor is removed and the cooling gas loop is not opened, the compressor must be fastened to the body with a suitable auxiliary mean, such as a wire. If it is necessary to fully remove the compressor, refer to [→ page 113](#).



**Note**

*Make sure that the flexible refrigerant hoses on the compressor remain unstressed.*



**Poly-V (elastic) belt travel:**

A - Poly-V belt (elastic) for the power steering and Generator (Alternator) -C- oil pump.

B - Poly-V belt (elastic) for air conditioner compressor.

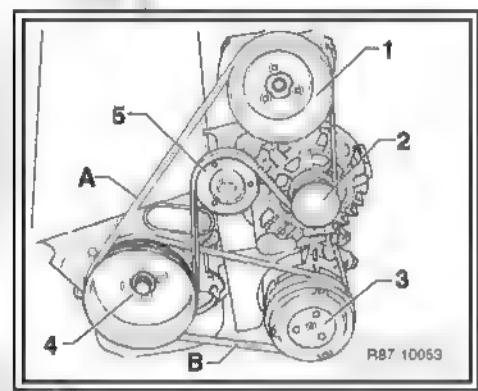
1 - Power steering oil pump pulley.

2 - Generator (Alternator) -C- pulley.

3 - Air conditioner compressor pulley.

4 - Crankshaft pulley.

5 - Idler roller.



**Note**

*When installing the belt, ensure that the pulley is correctly positioned.*

## 7.2 Air conditioning compressor support for 1.0 liters (AQZ, BJE, BNX) and 1.6 liters (BAH, BJA, BPA) engines - remove and install



**Note**

- ◆ The compressor support and respective components can be removed and installed without the need for opening the refrigerant circuit.
- ◆ To remove and install the Poly-V belt: [→ Engine; Rep. gr. 13; Crankshaft, pistons](#).



## 1 - Compressor support

### Removal:

- Remove the power steering pump and set it aside  $\Rightarrow$  Running gear, Axles, Steering; Rep. gr. 48 ; Steering
- Remove the Generator (alternator) -C-  $\Rightarrow$  Electrical system; Rep. gr. 27 ; Starter, alternator, battery
- Remove compressor from support and fasten it to body  $\Rightarrow$  [Item 7 \(page 92\)](#) .
- Remove the fastening screws -2 , 3, 4 and 5- and remove engine block support.

### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Observe the following fastening screw tightening sequence:
  - ◆ First tighten the fastening screws -3- and -5-, and then tighten the fastening screws -2- and -4-

### 2 - Screw

$50 \pm 2.5 \text{ Nm}$

### 3 - Screw

$50 \pm 2.5 \text{ Nm}$

### 4 - Screw

$50 \pm 2.5 \text{ Nm}$

### 5 - Screw

$50 \pm 2.5 \text{ Nm}$

### 6 - Bushings

### 7 - Compressor

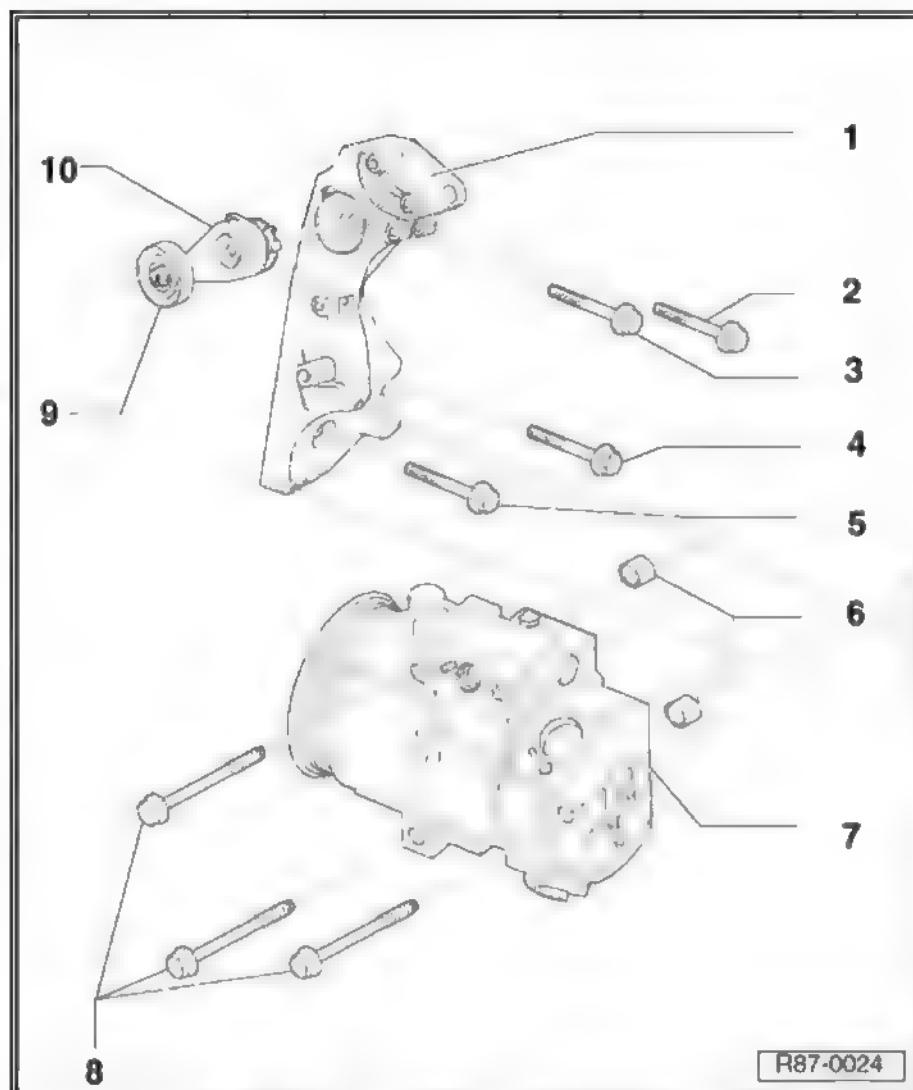
### Removal:

- Remove Poly-V belt  $\Rightarrow$  Engine; Rep. gr. 13 ; Crankshaft, pistons .
- Remove fastening screws-8-  $\Rightarrow$  [Item 8 \(page 93\)](#) .
- Remove compressor from support and fasten it to body  $\Rightarrow$  [page 93](#)

### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten the compressor fastening screws -8- with a  $\Rightarrow$  [Item 8 \(page 93\)](#) torque
- Check Poly-V belt travel  $\Rightarrow$  [page 93](#) .





**Note**

*In the event the compressor needs to be completely removed, see [→ page 113](#)*

**8 - Screws**

$23 \pm 2.3$  Nm

**9 - Poly-V belt tensioning pulley**

$45 \pm 4.5$  Nm

**10 - Tensioning element on tensioning pulley**

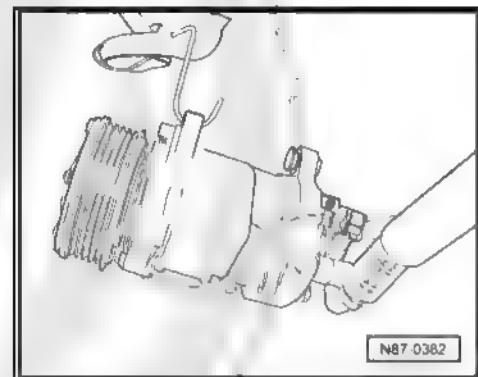
**Fastening the air conditioner compressor to the body:**

If the air conditioning compressor is removed and the cooling gas loop is not opened, the compressor must be fastened to the body with a suitable auxiliary mean, such as a wire. If it is necessary to fully remove the compressor, refer to [→ page 113](#).



**Note**

*Make sure that the flexible refrigerant hoses on the compressor remain unstressed.*



N87-0382

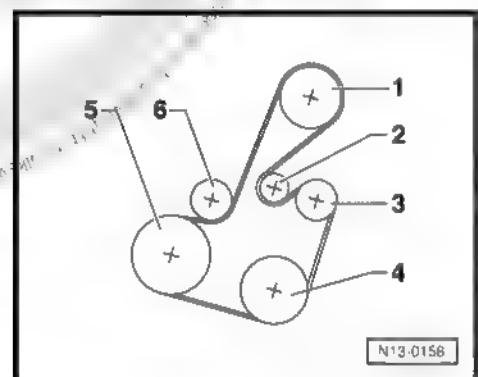
**Poly-V belt travel:**

- 1 - Power steering oil pump pulley
- 2 - Return pulley
- 3 - Generator (Alternator) -C- pulley
- 4 - Air conditioning compressor pulley
- 5 - Crankshaft pulley
- 6 - Tensioning roller



**Note**

*When installing the belt, ensure that the pulley is correctly positioned.*



N13-0158

**7.3 Air conditioning compressor bracket for 1.4-liter engines (BKR) - remove and install**



**Note**

- ◆ The compressor support and respective components can be removed and installed without the need for opening the refrigerant circuit
- ◆ To remove and install the Poly-V belt: [→ Engine; Rep. gr. 13; Crankshaft, pistons](#).



## 1 - Compressor support

### Removal:

- Remove the Generator (alternator) -C- ⇒ Electrical system; Rep. gr. 27 ; Starter, alternator, battery .
- Remove compressor from support and fasten it to body [⇒ Item 7 \(page 94\)](#) .
- Remove the fastening screws -2, 3, 4 and 5- and remove engine block support.

### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Observe the following fastening screw tightening sequence:
  - ◆ First tighten the fastening screws -2 and 3-, and then tighten the fastening screws -4 and 5-

### 2 - Screw

50 Nm

### 3 - Screw

45 Nm

### 4 - Screw

50 Nm

### 5 - Screw

45 Nm

### 6 - Cooling system hoses

### 7 - Compressor

### Removal:

- Remove Poly-V belt ⇒ Engine; Rep. gr. 13 ; Crankshaft, pistons .
- Remove fastening screws-8- [⇒ Item 8 \(page 94\)](#) .
- Remove compressor from support and fasten it to body [⇒ page 95](#)

### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten the compressor fastening screws -8- with a [⇒ Item 8 \(page 94\)](#) torque.
- Check Poly-V belt travel [⇒ page 95](#) .

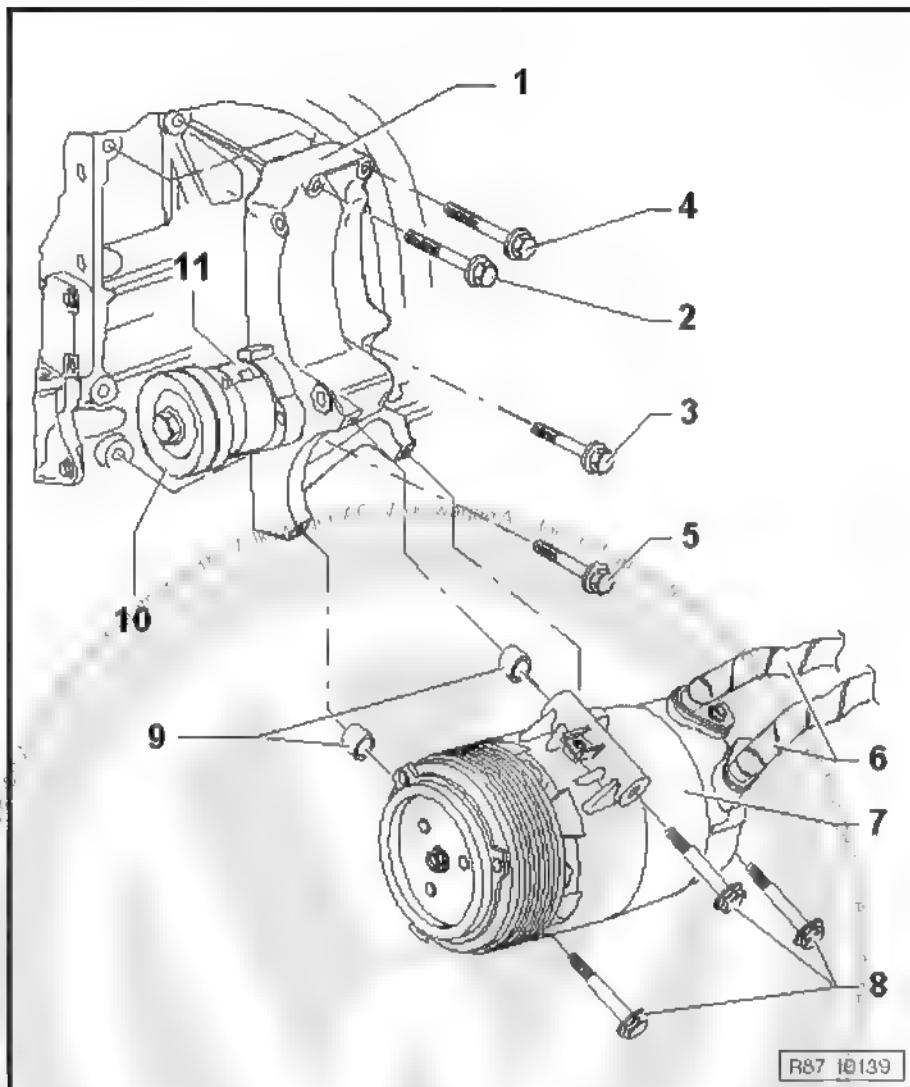


### Note

*In the event the compressor needs to be completely removed, see [⇒ page 113](#)*

### 8 - Screws

3 units





□ 25 Nm

9 - Sleeve

10 - Tensioning roller

11 - Tensioning element on tensioning pulley

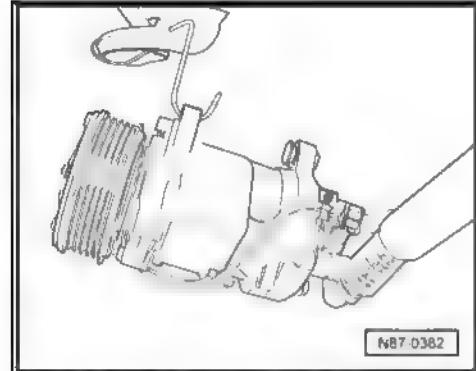
**Fastening the air conditioner compressor to the body:**

If the air conditioning compressor is removed and the cooling gas loop is not opened, the compressor must be fastened to the body with a suitable auxiliary mean, such as a wire. If it is necessary to fully remove the compressor, refer to [page 113](#).



**Note**

*Make sure that the flexible refrigerant hoses on the compressor remain unstressed.*



NB7 0382

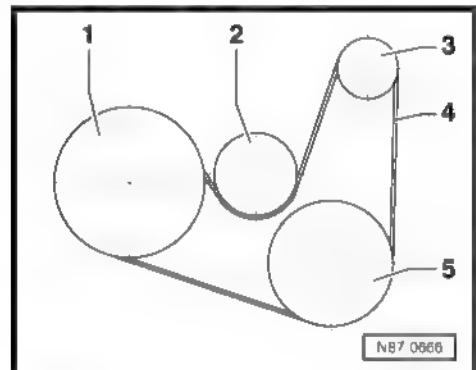
**Poly-V belt travel:**

- 1 - Crankshaft pulley
- 2 - Tensioning roller
- 3 - Generator (Alternator) -C- pulley
- 4 - Poly-V belt
- 5 - Air conditioning compressor pulley



**Note**

*When installing the belt, ensure that the pulley is correctly positioned.*



NB7 0666

## 7.4 Air conditioning compressor bracket for 1.2-liter engines (BMD) - remove and install



**Note**

- ◆ The compressor support and respective components can be removed and installed without the need for opening the refrigerant circuit.
- ◆ To remove and install the Poly-V belt: ⇒ Engine; Rep. gr. 13; Crankshaft, pistons .

**1 - Coupling guides**

- 2 units
- Pay attention on the correct seating on the support.

**2 - Compressor****Removal:**

- Remove Poly-V belt => Engine; Rep. gr. 13 ; Crankshaft, pistons .
- Remove fastening screws -3 and 4-.
- Remove compressor from support and fasten it to body [⇒ page 96](#)

**Installation:**

Installation is performed in reverse sequence to the removal, observing the following:

- Observe the following fastening screw tightening sequence:
  - ◆ Tighten the fastening screws -4- with [⇒ Item 4 \(page 96\)](#) torque.
  - ◆ Tighten fastening screw -3- to a [⇒ Item 3 \(page 96\)](#) torque.
  - Check Poly-V belt travel [⇒ page 97](#).

**Note**

*In the event the compressor needs to be completely removed, see [⇒ page 113](#)*

**3 - Screw**

- 25 Nm

**4 - Screws**

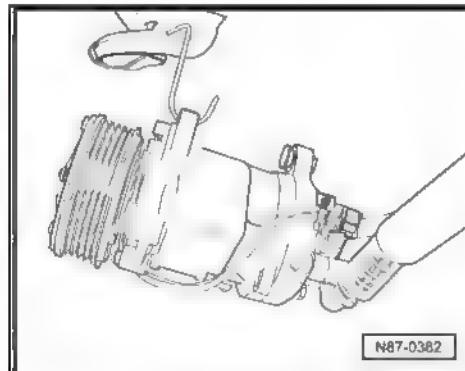
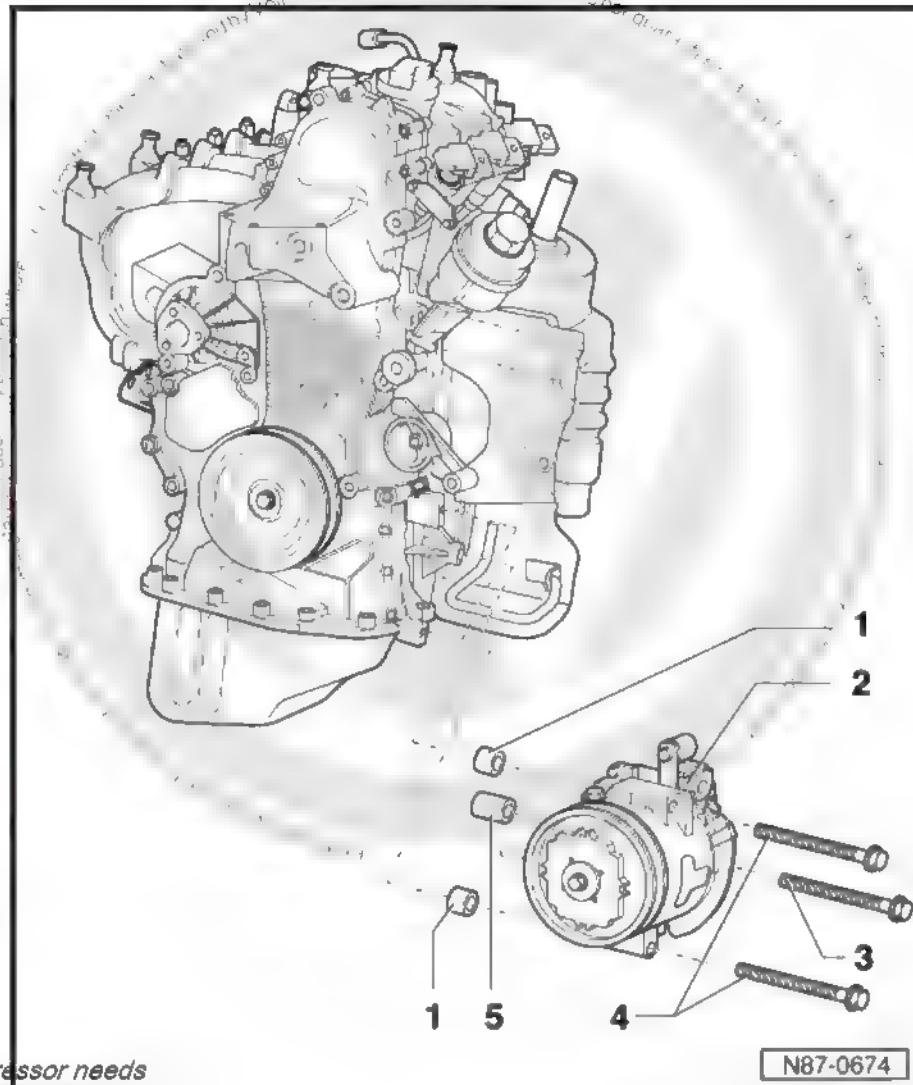
- 2 units
- 25 Nm

**5 - Sleeve****Fastening the air conditioner compressor to the body:**

If the air conditioning compressor is removed and the cooling gas loop is not opened, the compressor must be fastened to the body with a suitable auxiliary mean, such as a wire. If it is necessary to fully remove the compressor, refer to [⇒ page 113](#).

**Note**

*Make sure that the flexible refrigerant hoses on the compressor remain unstressed.*





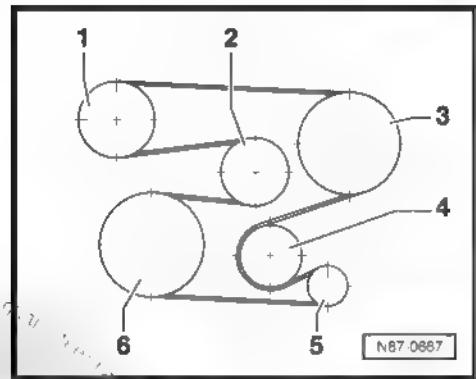
Poly-V belt travel:

- 1 - Coolant pump pulley
- 2 - Tensioning roller
- 3 - Air conditioning compressor pulley
- 4 - Intermediate pulley
- 5 - Generator (Alternator) -C- pulley
- 6 - Crankshaft pulley



Note

*When installing the belt, please ensure the pulley is correctly positioned.*



**7.5 Airconditioning compressor bracket for 1.4-liter engines (BNM) - remove and install**



Note

- ◆ *The compressor support and respective components can be removed and installed without the need for opening the refrigerant circuit.*
- ◆ *To remove and install the Poly-V belt: ⇒ Engine; Rep. gr. 13; Crankshafts, pistons.*



### 1 - Compressor support

#### Removal:

- Remove the Generator (alternator) -C- ⇒ Electrical system; Rep. gr. 27 ; Starter, alternator, battery
- Remove compressor from support and fasten it to body [⇒ Item 4 \(page 98\)](#)
- Remove the fastening screws -2- and remove the engine block support

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Observe the following fastening screw tightening sequence:
  - ◆ -A, B, C, D, E and F-

### 2 - Screw

- 6 units
- 45 Nm

### 3 - Cooling system hoses

### 4 - Compressor

#### Removal:

- Remove Poly-V belt ⇒ Engine; Rep. gr. 13 ; Crankshafts, pistons .
- Remove fastening screws -5-.
- Remove compressor from support and fasten it to body [⇒ page 99](#)

#### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten the compressor fastening screws -5- to (25 Nm).
- Check Poly-V belt travel [⇒ page 99](#) .



#### Note

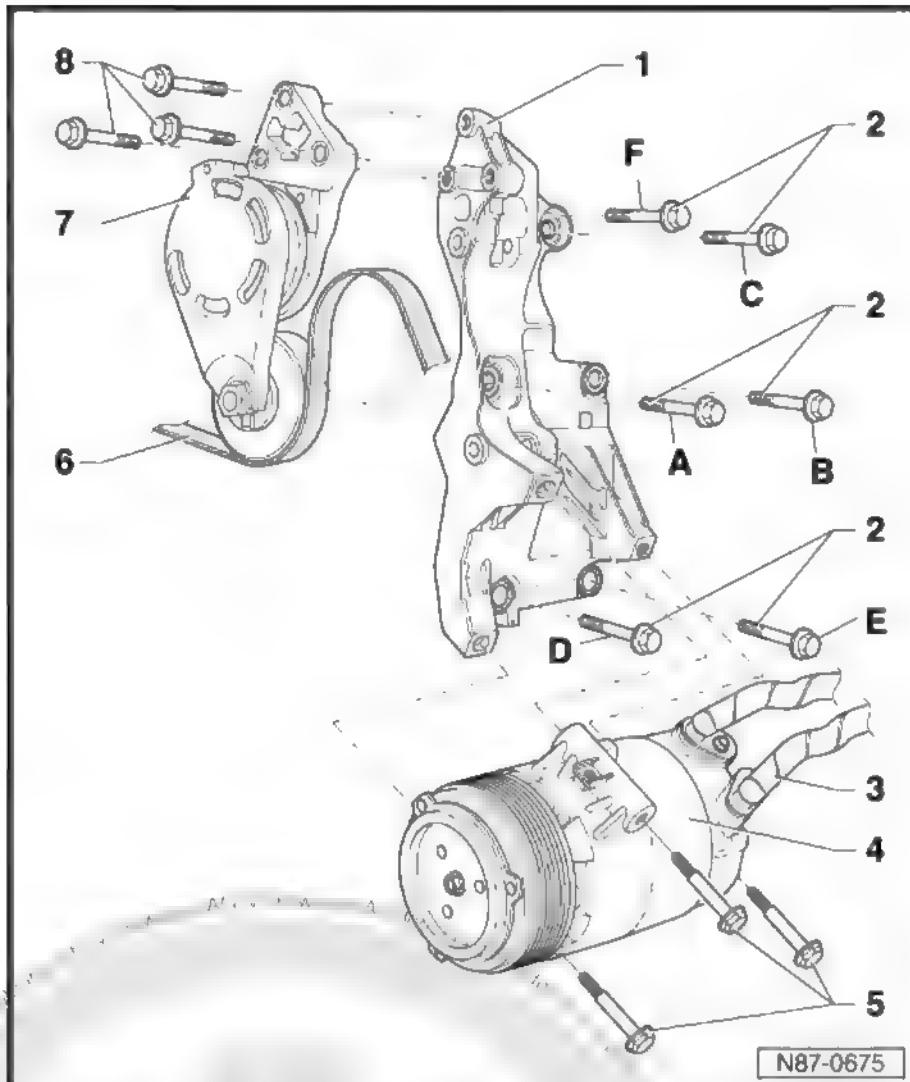
*In the event the compressor needs to be completely removed, see [⇒ page 113](#)*

### 5 - Screws

- 3 units
- 25 Nm

### 6 - Poly-V belt

- Remove and install ⇒ Engine; Rep. gr. 13 ; Crankshaft, pistons





## 7 - Tensioning element on tensioning pulley

### 8 - Screws

- 3 units
- 25 Nm

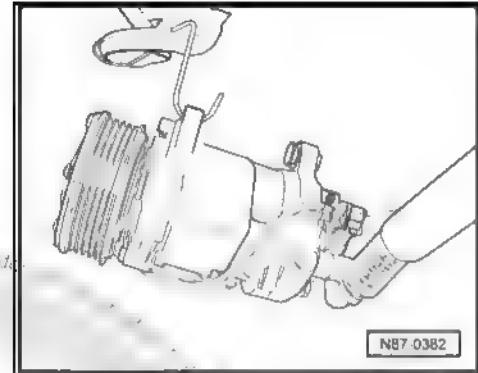
Fastening the air conditioner compressor to the body:

If the air conditioning compressor is removed and the cooling gas loop is not opened, the compressor must be fastened to the body with a suitable auxiliary mean, such as a wire. If it is necessary to fully remove the compressor, refer to [⇒ page 113](#).



### Note

*Make sure that the flexible refrigerant hoses on the compressor remain unstressed.*



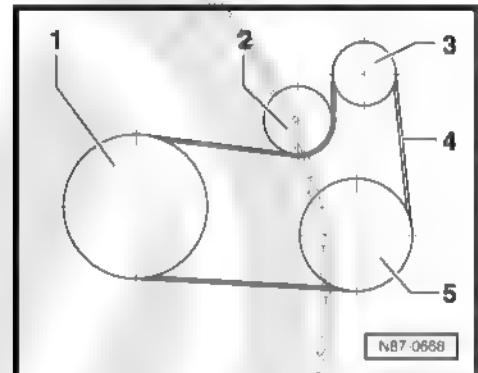
Poly-V belt travel:

- 1 - Crankshaft pulley
- 2 - Tensioning roller
- 3 - Generator (Alternator) -C- pulley
- 4 - Poly-V belt
- 5 - Air conditioning compressor pulley



### Note

*When installing the belt, ensure that the pulley is correctly positioned.*



## 7.6 Air conditioning compressor bracket for 1.9-liter engines (ASY) - remove and install



### Note

- ◆ *The compressor support and respective components can be removed and installed without the need for opening the refrigerant circuit.*
- ◆ *To remove and install the Poly-V belt: ⇒ Engine; Rep. gr. 13; Crankshaft, pistons.*



## 1 - Compressor support

### Removal:

- Remove the Generator (alternator) -C- ⇒ Electrical system; Rep. gr. 27 ; Starter, alternator, battery .
- Remove compressor from support and fasten it to body  
⇒ [Item 4 \(page 100\)](#)
- Remove the fastening screws -2- and remove the engine block support

### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Observe the following fastening screw tightening sequence:
  - ◆ -A, B, C, D, E and F-

## 2 - Screws

- 6 units
- 45 Nm

## 3 - Refrigerant system hose

## 4 - Compressor

### Removal:

- Remove Poly-V belt ⇒ Engine; Rep. gr. 13 ; Crankshaft, pistons .
- Remove fastening screws -5-.
- Remove compressor from support and fasten it to body ⇒ [page 101](#)

### Installation:

Installation is performed in reverse sequence to the removal, observing the following:

- Tighten the compressor fastening screws -5- to (25 Nm).
- Check Poly-V belt travel ⇒ [page 101](#) .



### Note

*In the event the compressor needs to be completely removed, see  
⇒ [page 113](#)*

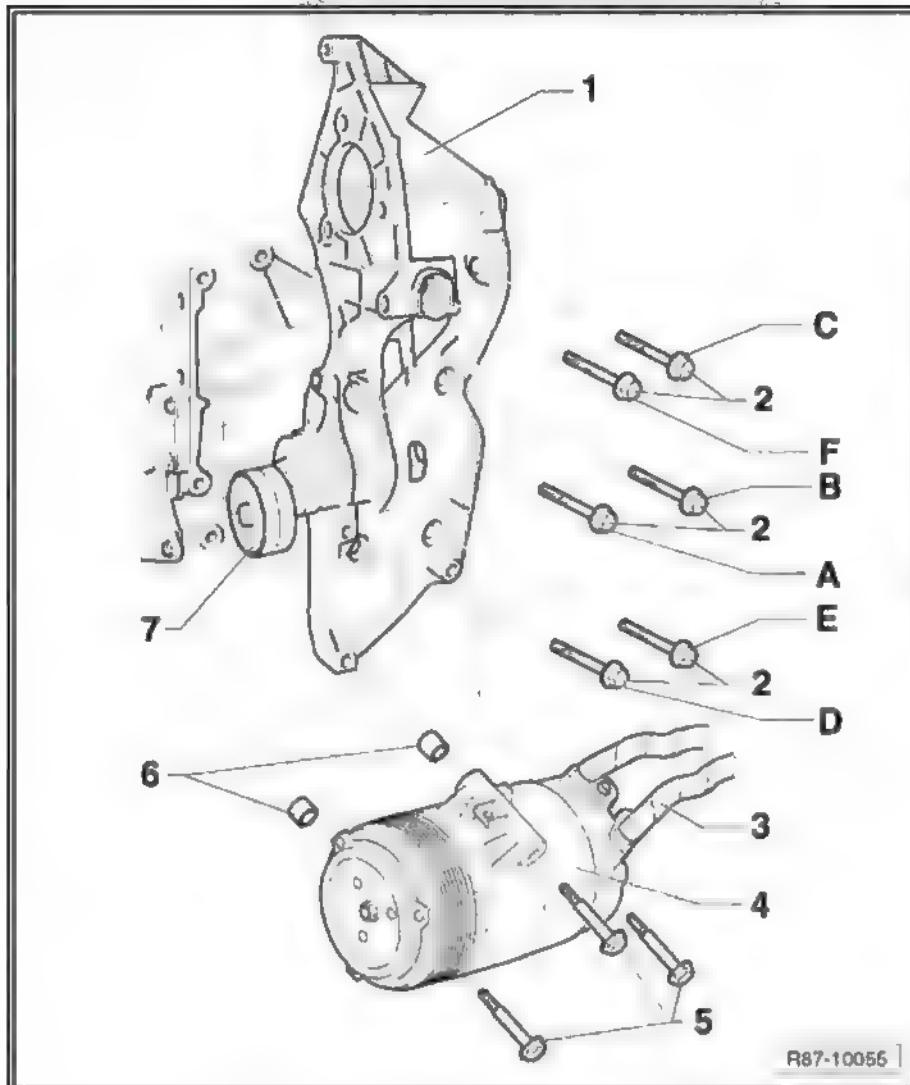
## 5 - Screws

- 3 units
- 25 Nm

## 6 - Sleeve

- 2 units

## 7 - Tensioning element on tensioning pulley





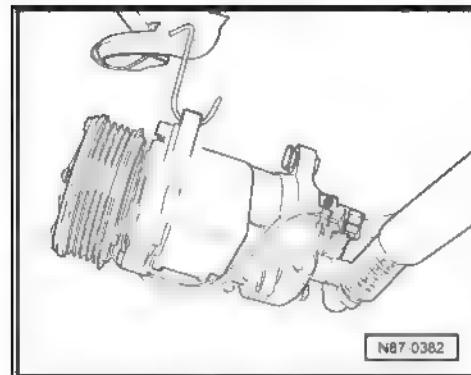
### Fastening the air conditioner compressor to the body:

If the air conditioning compressor is removed and the cooling gas loop is not opened, the compressor must be fastened to the body with a suitable auxiliary mean, such as a wire. If it is necessary to fully remove the compressor, refer to [page 113](#).



#### Note

*Make sure that the flexible refrigerant hoses on the compressor remain unstressed.*



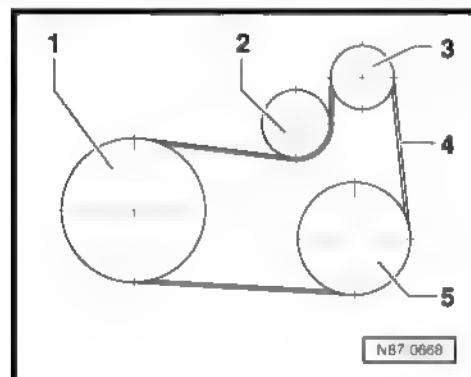
### Poly-V belt travel:

- 1 - Crankshaft pulley
- 2 - Tensioning roller
- 3 - Generator (Alternator) -C- pulley
- 4 - Poly-V belt
- 5 - Air conditioning compressor pulley



#### Note

*When installing the belt, ensure that the pulley is correctly positioned.*





## 8      Refrigerant circuit - assembly overview



### WARNING

*Before working on the heating and air conditioning system, it is necessary to disconnect the battery earth strap from the Battery -A- ⇒ Electrical equipment; Rep. gr. 27; Starter motor, alternator, battery.*



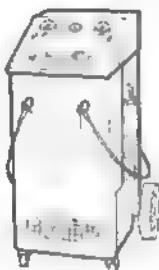
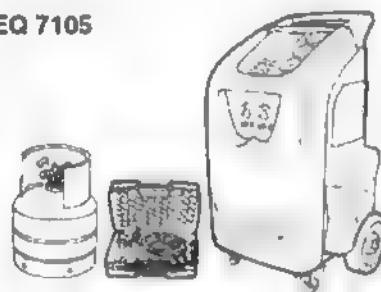
### Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the Battery -A- earth wire.*
- ◆ *When the Battery -A- earth wire is reconnected, check vehicle equipment (radio, clock, centre locking, electric windows, etc.) according to the Workshop Manual and/or instructions for use.*
- ◆ *Repairs to the refrigerant circuit must only be performed at authorized and specialized technical assistance workshops.*
- ◆ *The refrigerant must be aspirated with the Climate control recovery, recycling and refill set or VAS 6008-EQ 7098- or similar equipment ⇒ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .*
- ◆ *Indications on repair work on vehicles with air conditioning system and how to handle the refrigerant ⇒ page 56*
- ◆ *All refrigerant circuit components that are open must be closed with proper plugs to prevent humidity from entering them.*
- ◆ *The color identification of refrigerant circuit sealing rings with R134a is no longer used. Black sealing rings are now used.*
- ◆ *Only the components tagged with asterisk (\*) could be replaced without being opened or without aspirating the cooling loop gas.*



Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7105-
- ◆ Torque wrench - 5 to 50 Nm (enc. 1/2") -VAG 1331-

<b>EQ 7098</b> 	<b>EQ 7104</b> 
<b>EQ 7105</b> 	<b>VAG 1331</b> 

087-10003



Note

For indications of additional tools and indications on how to carry out repairs in vehicles with air conditioning and how to handle refrigerant can be found in the ELSA system => Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .

Refrigerant circuit - assembly overview:



1 - High pressure sensor -G65-  
(  
□ Remove and install  
⇒ [page 87](#)  
□ Check ⇒ [page 87](#)

2 - Nut

□ 1,9 Nm

3 - Screw

□ 10 Nm

4 - Expansion valve

□ Remove and install  
⇒ [page 120](#)

5 - Sealing ring

□ Replace

□ 11,10 mm; 1,78 mm

6 - Sealing ring

□ Replace

□ 0,68 in; 1,78 mm

7 - Sealing ring

□ Replace

□ 10,8 mm; 1,82 mm

8 - Sealing ring

□ Replace

□ 14,30 mm; 2,40 mm

9 - Hose

□ High pressure

□ From the drying filter  
container to the evapo-  
rator

10 - Nut

□ 10 Nm

11 - Evaporator

12 - Plate

13 - Service valve

□ High pressure

□ Location ⇒ [page 60](#)

□ Environmental contamination by the cooling gas is a punishable offense

□ Filling capacities ⇒ [page 126](#)

14 - Screw

□ 5 Nm

15 - Screw

□ 12 Nm

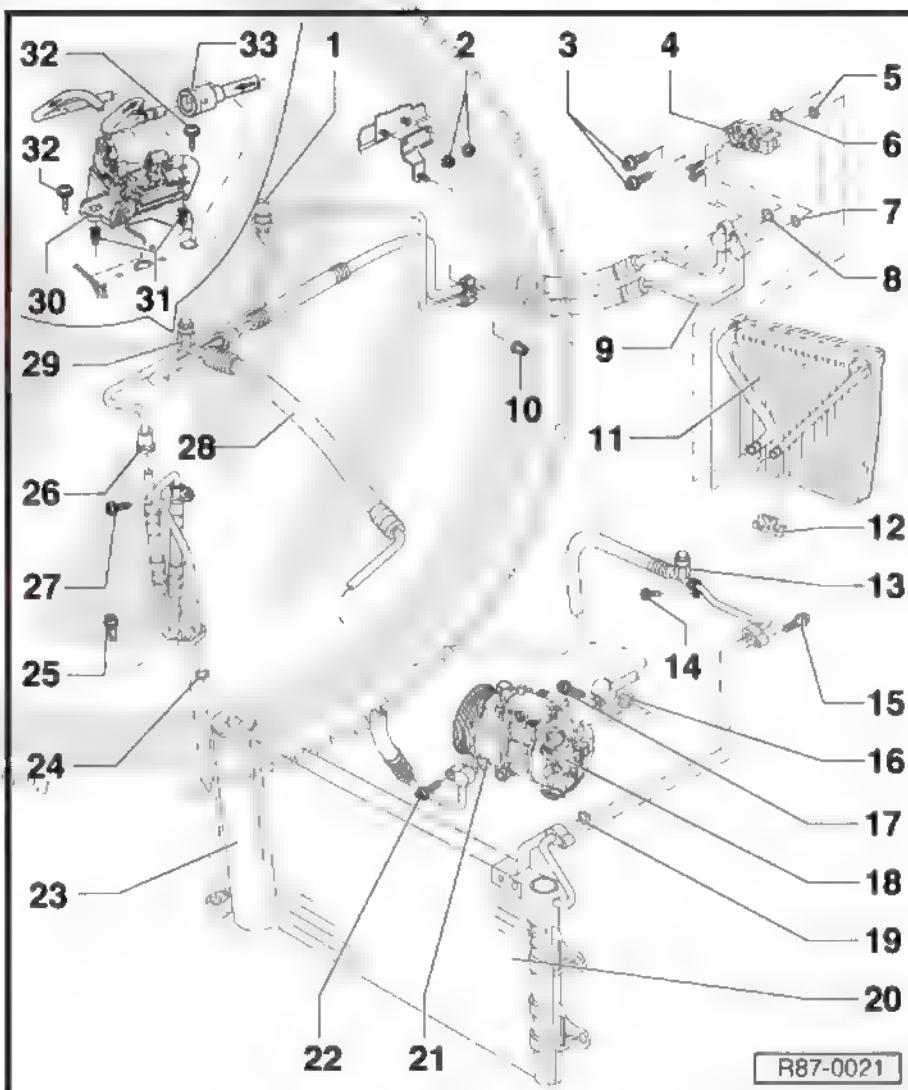
16 - Sealing ring

□ Replace

□ 14,3 mm; 2,4 mm

17 - Screw

□ 22 Nm





18 - Compressor

- Remove and install [page 113](#)

19 - Sealing ring

- Replace
- 10.8 mm; 1.82 mm

20 - Condenser

- Remove and install [page 116](#)

21 - Sealing ring

- Replace
- 10.8 mm; 1.82 mm

22 - Screw

- 22 Nm

23 - Dryer filter receiver

- Remove the filtering element [page 118](#)

24 - Sealing ring

- Replace
- 10.8 mm; 1.82 mm

25 - Screw

- 22 Nm

26 - Quick-release coupling

- Remove and install [page 122](#)

27 - Screw

- 5 Nm

28 - Hose

- Low pressure
- From the evaporator to the compressor

29 - Service valve

- Low pressure
- Location [page 60](#)
- Environmental contamination by the cooling gas is a punishable offense
- Filling capacities [page 126](#)

30 - Pipe support

31 - Bearings

32 - Screws

33 - Quick-release coupling

- Remove and install [page 122](#)



## 8.1 Air conditioning magnetic coupling - N25- manufacturer Delphi (model 1) - repair



### Note

- ◆ In order to repair the Air conditioning magnetic clutch -N25-, with the compressor installed, it is not necessary to open the refrigerant circuit.
- ◆ Only in exceptional or extreme situations, the magnetic clutch may be repaired with the compressor installed.
- ◆ If the compressor must be removed, aspirate the refrigerant with the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment => Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .
- ◆ In vehicles with diesel engine, it is necessary to remove the "intercooler" => Engine; Rep. gr. 21 ; Overcharge - turbo .

### Air conditioning magnetic coupling -N25- - Assembly overview:

1 - Control valve with retaining ring set

2 - High pressure relief valve set

3 - Drainage screw

□ 16.0.19 Nm.

4 - Air conditioning magnetic clutch -N25-

□ Electromagnetic coil (► 04/30/08).

□ Remove and install  
⇒ [page 107](#).

5 - Retaining ring

□ Replace.

6 - Rotor

7 - Retaining ring

□ Replace.

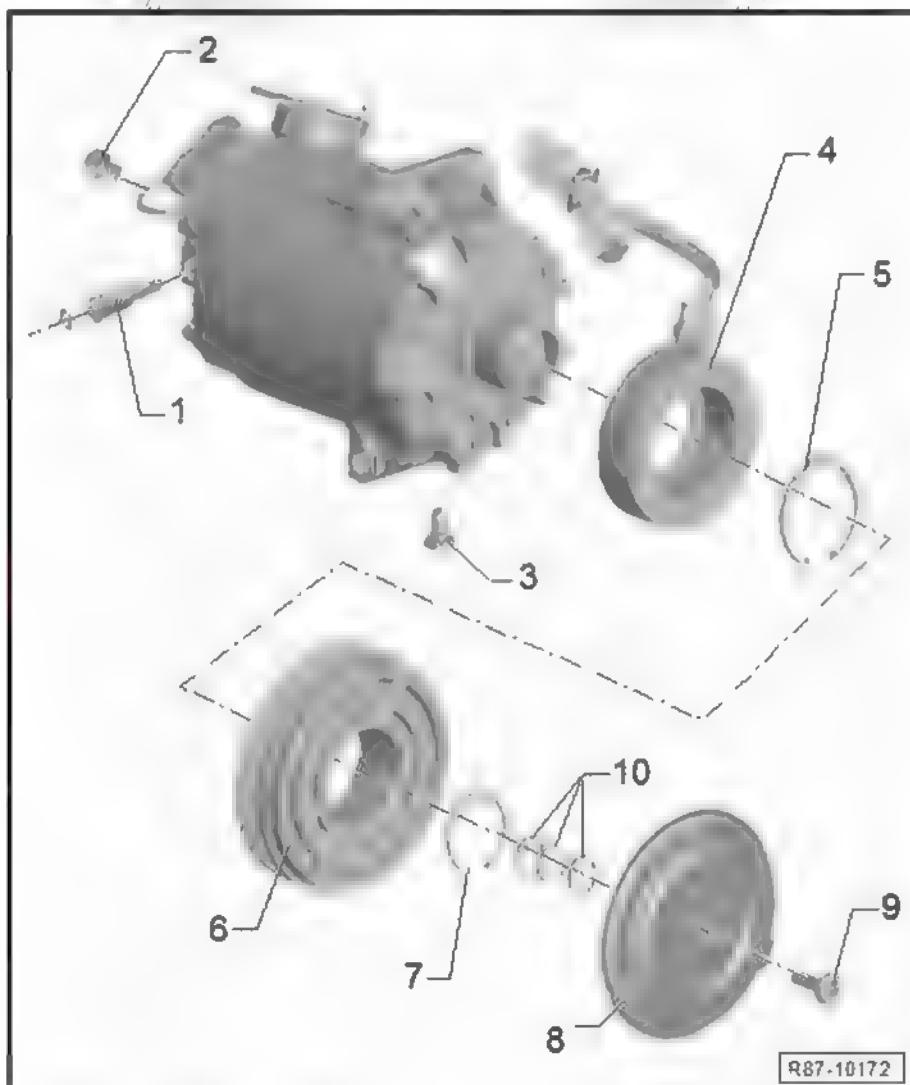
8 - Coupling disc

9 - Screw

□ Always replace when removed.

□ 9. 0.12 Nm.

10 - Adjusting washers

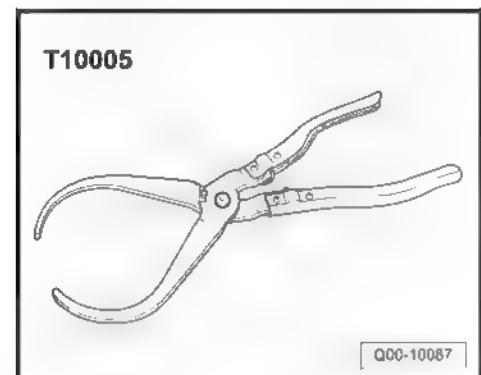




### 8.1.1 Electromagnetic clutch for Delphi compressor (model 1) - remove and install

Special tools and workshop equipment required

- ◆ Pliers -T 10005-



### 8.1.2 Removal

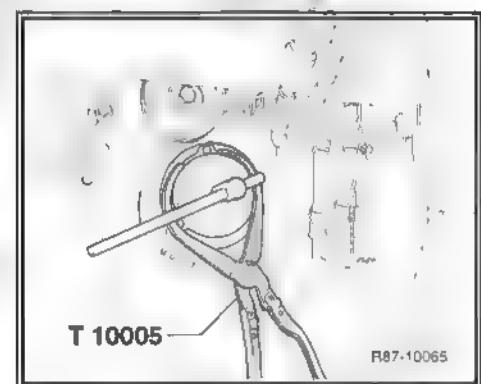
- Remove the lower engine noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - front part .
- Remove right front wheel arch trim panel ⇒ Body - External assembly works; Rep. gr. 66 ; External equipment .
- Mark the belt operating direction.
- Remove the Poly-V belt for the air conditioning compressor ⇒ Engine; Rep. gr. 13 ; Crankshaft, pistons .
- Disconnect the connector for the Air conditioning magnetic clutch -N25- harness.
- Remove coupling disc using Pliers -T 10005- and Gedore socket -T30- .



#### Note

*Be careful not to lose the adjusting washers while removing the coupling disc.*

- Remove the circlip and pulley.
- Remove circlip and Air conditioning magnetic coupling -N25- .



### 8.1.3 Installation

The installation occurs in the reversal sequence of removal, observing the following instructions:

**Note**

When installing the Air conditioning magnetic coupling -N25- , observe locking position of compressor -arrows-

**Note**

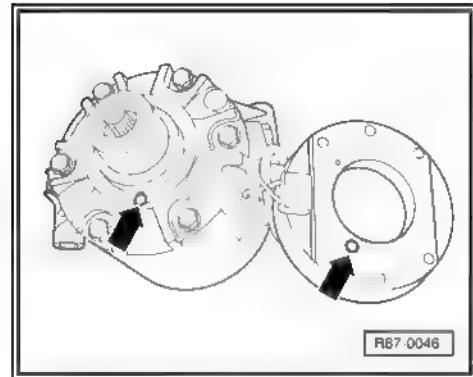
In case of replacing the coupling disc and/or Air conditioning magnetic clutch -N25- , use the proper number of adjustment washers.

To do so, check the distance between the hub and the pulley.

- The distance must be between 0.3 and 0.6 mm.

**WARNING**

Replace the screw that fastens the coupling disc to the compressor axle.



## 8.2 Air conditioning magnetic coupling - N25- manufacturer Delphi (model 2) ► - repair

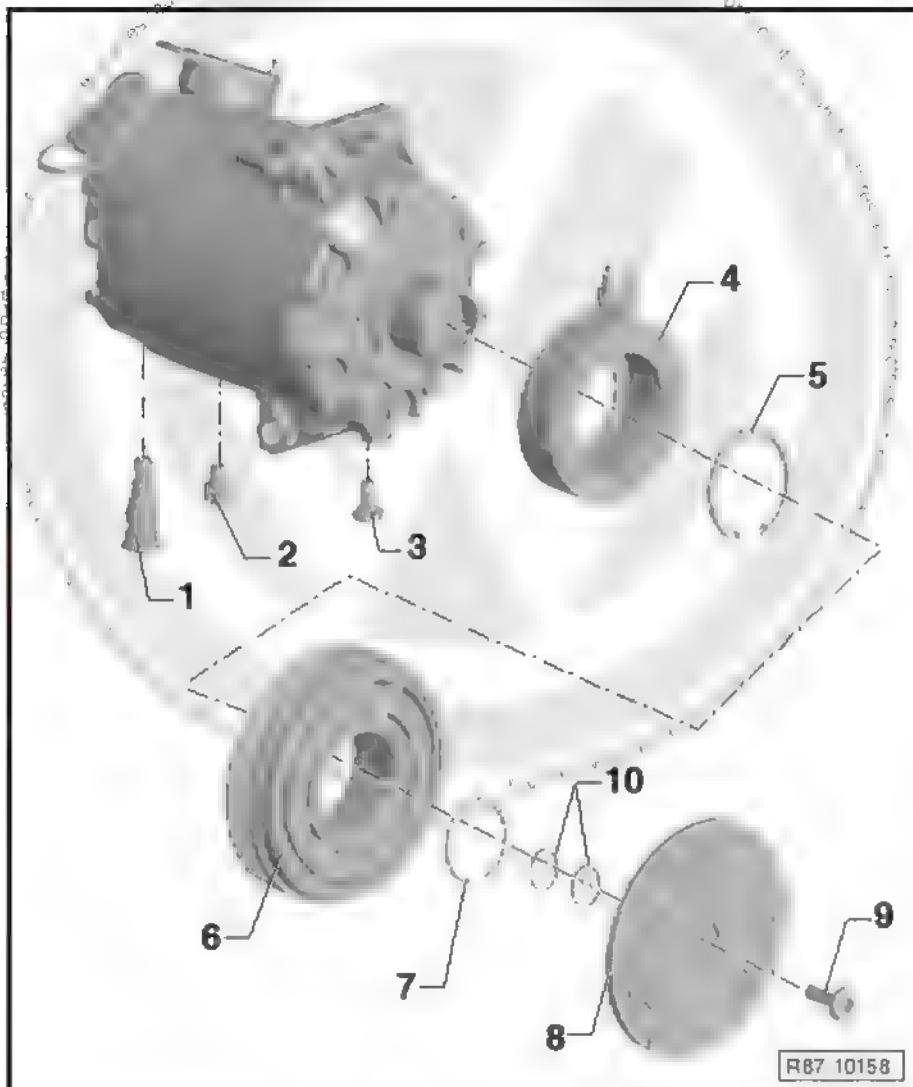
**Note**

- ◆ In order to repair the Air conditioning magnetic clutch -N25- , with the compressor installed, it is not necessary to open the refrigerant circuit.
- ◆ Only in exceptional or extreme situations, the magnetic clutch may be repaired with the compressor installed.
- ◆ If the compressor must be removed, aspirate the refrigerant with the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment => Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .
- ◆ In vehicles with diesel engine, it is necessary to remove the "intercooler" => Engine; Rep. gr. 21 ; Overcharge - turbo .

Air conditioning magnetic coupling -N25- - Assembly overview:



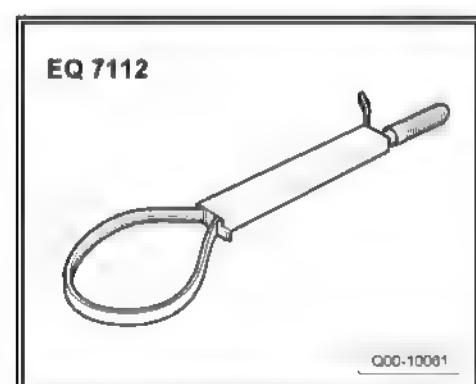
- 1 - Control valve with retaining ring set
- 2 - High pressure relief valve set
- 3 - Drainage screw
  - 16..0.19 Nm.
- 4 - Air conditioning magnetic clutch -N25-
  - Electromagnetic coil (► 04/30/08).
  - Remove and install  
⇒ [page 109](#).
- 5 - Retaining ring
  - Replace.
- 6 - Rotor
- 7 - Retaining ring
  - Replace.
- 8 - Coupling disc
- 9 - Screw
  - 9..0.12 Nm
  - Replace
- 10 - Adjusting washers



### 8.3 Delphi compressor electromagnetic clutch (model 2) - remove and install

Special tools and workshop equipment required

- ◆ Poly-V pulley locking lever -EQ 7112-



#### 8.3.1 Removal

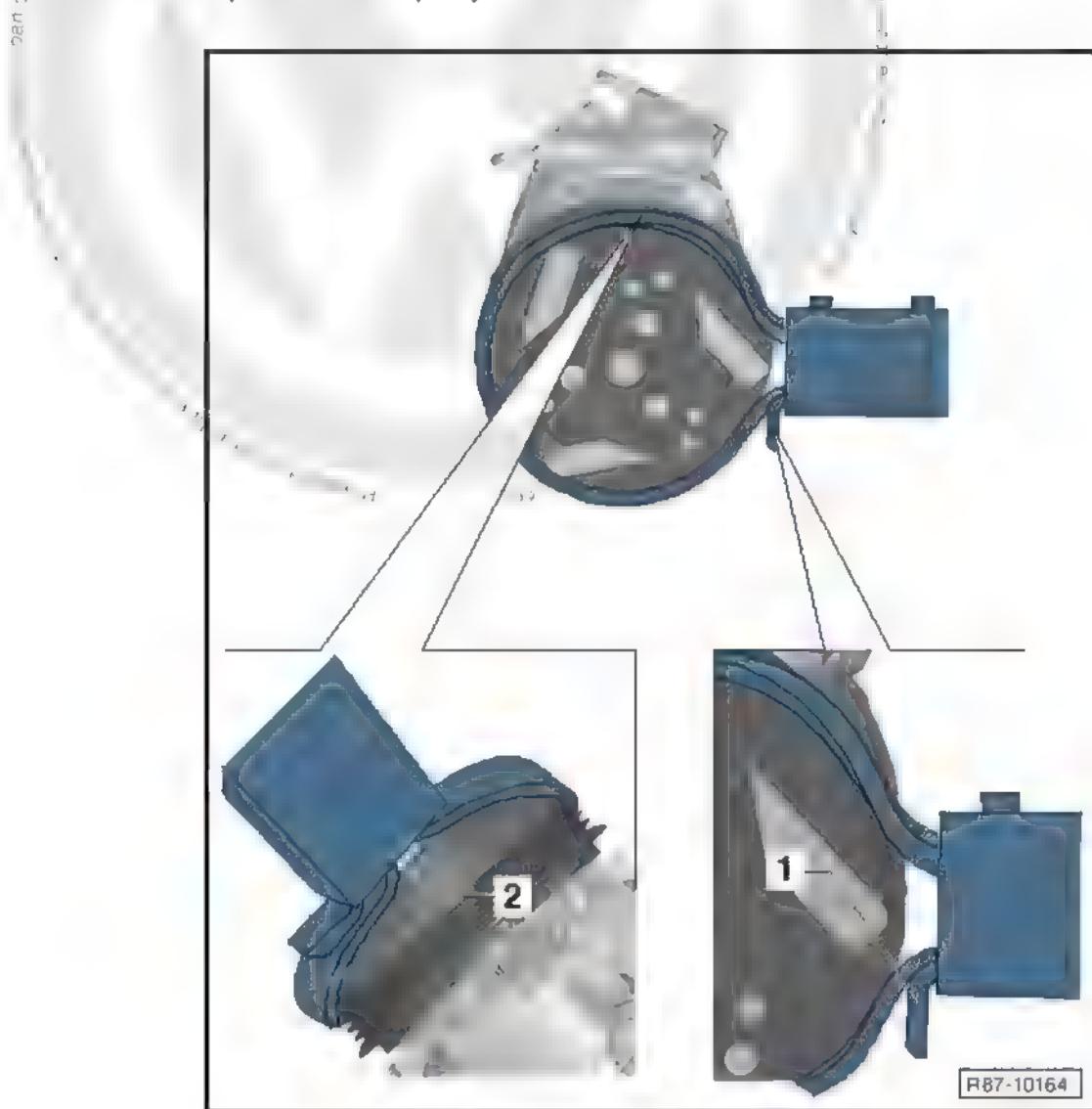
- Remover horn ⇒ Electrical equipment, Rep. gr. 96 ; Internal lights and lamps, switches, anti-theft protection



- Remove engine lower noise insulation → General body repairs, exterior; Rep. gr. 50 ; Body - Front part
- Remove right front wheel arch trim panel → Body - External assembly works; Rep. gr. 66 , External equipment .
- Remove Poly-V belt → Cylinder injection engine (1.0l); Rep. gr. 13 ; Engine - mech. crankshaft, plungers .
- Disconnect the connector for the Air conditioning magnetic clutch -N25- harness.

Install tool EQ 71t2

In order to perform this operation, the tool must be positioned in an angle so that the brake -1- touches the coupler and the belt -2- and has contact both with the coupler and the set pulley.

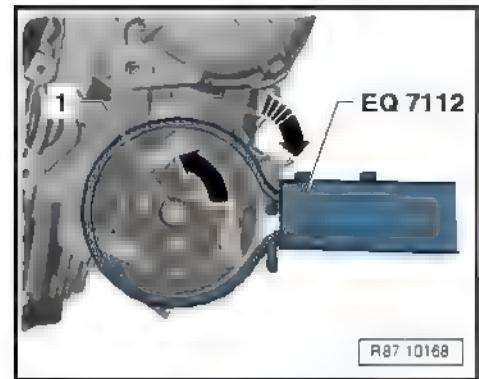




- Loosen the fastening screw -1- in the direction of the -arrow- and simultaneously move the Poly-V Pulley locking rod -EQ 7112- clockwise as indicated by the -arrow- in order to remove the coupling disc.

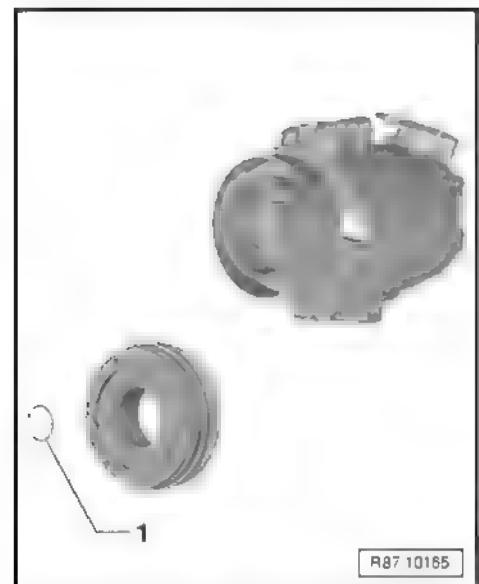


*Be careful not to lose the adjusting washers while removing the coupling disc.*



R87 10168

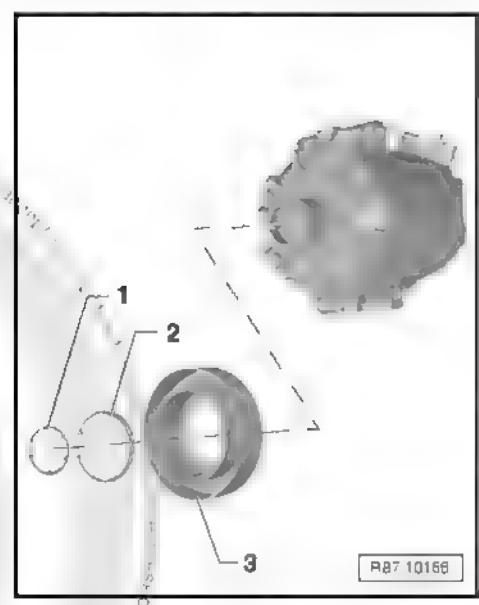
- Remove the lock ring -1-.



R87 10165

- Remove the circlips -1- and -2-, from the Magnetic clutch of the air conditioner -N25- -3-.

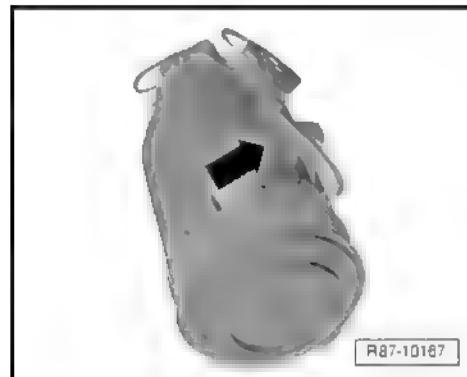
For vehicles with the compressor 520.820.803



R87 10166



- Remove the bolt -arrow- and remove the Air conditioning magnetic coupling -N25- .



### 8.3.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

- Install Poly-V belt  $\Rightarrow$  Cylinder injection engine (1.0l); Rep. gr. 13 ; Engine - mech. crankshaft, plungers .



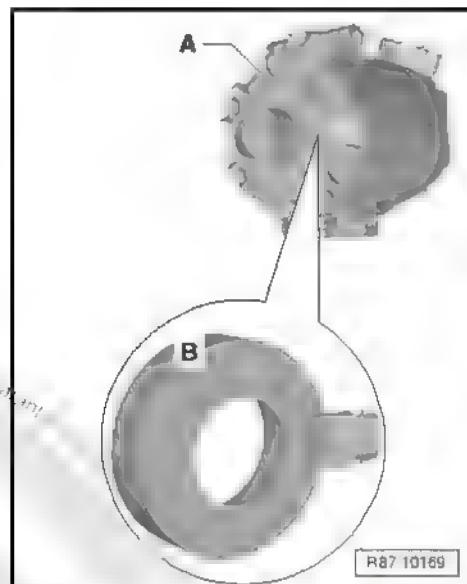
#### Note

*During the installation of the Magnetic clutch of the air conditioner -N25-, the pin -B- must be fitted into the cavity -A-.*



#### WARNING

*Replace the screw that fastens the coupling disc to the compressor axle.*



- Tighten the fastening screw -1- to (9.5...12 Nm) towards -arrow- while moving the Locking rod for Poly-V Belt -EQ 7112- anticlockwise, as indicated by -arrow-.



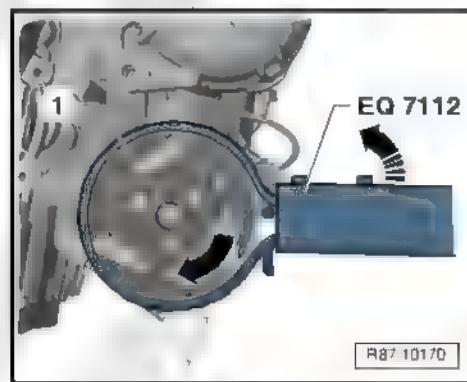
#### Note

*In case of replacing the coupling disc and/or Air conditioning magnetic clutch -N25-, use the proper number of adjustment washers.*

To do so, check the distance between the coupling disc and the pulley.

**Inspection of gap between coupler and pulley:**

- Inspection of gap between the coupler and the pulley, by using a feeler gauge.





The gap between the coupler and the pulley must be inspected at 3 different points, spaced at 120° from one another -arrows-.

Between the coupler and the pulley, obtain a gap of 0.3... 0.9 mm.

The average among the 3 measurements taken must be less than 0.6 mm

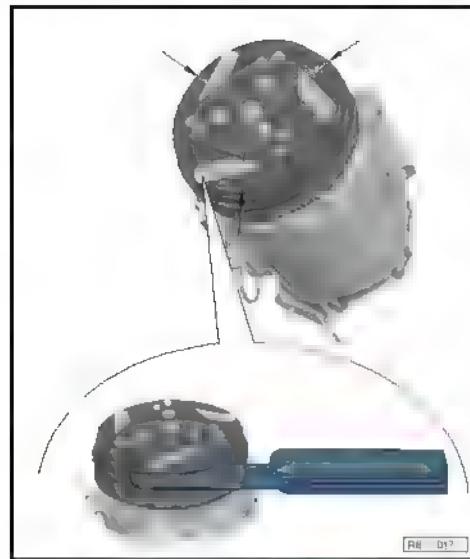
The inspection procedure must be repeated until the specified gap is reached.

- Start the engine.
- Activate the compressor by turning the air conditioner on.

The compressor must remain on for 15 sec., and off for 15 sec. This operation must be repeated 5 times.

- Inspect again the space between the coupler and the pulley.

If the space is not in accordance with the specifications, repeat the inspection procedure completely



RH D12

## 8.4 Compressor - remove and install



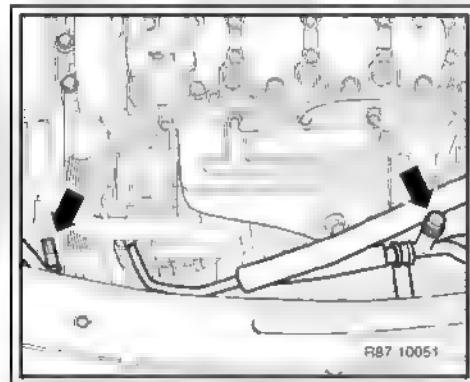
### WARNING

*When replacing the compressor, carefully remove the closing plug, so as to avoid releasing pressure gas. In this way, you will prevent the oil in the compressor from leaking.*

*The compressor should be installed with the same amount of oil previously in it ⇒ Air conditioning with R134a refrigerant gas; Rep. gr. 00 ; Technical data .*

### 8.4.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas ⇒ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .
- Remove right front wheel arch trim panel ⇒ Body - External assembly works; Rep. gr. 66 ; External equipment .
- Mark the belt operating direction.
- Remove Poly-V belt ⇒ Engine; Rep. gr. 13 ; Crankshaft, pistons .
- Disconnect the harness connector from electromagnetic clutch.



RH D12



Note

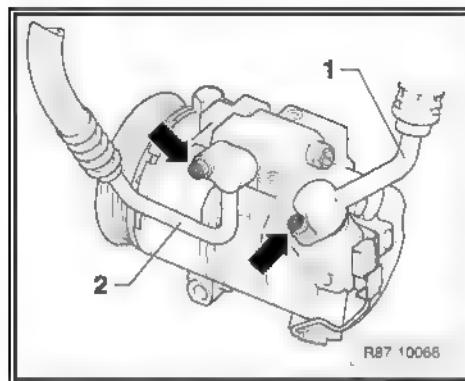
*Illustrative figure, valid for all compressors.*

- Loosen the fastening screws -arrows-, and remove the hose -1- and -2- for the refrigerant gas.



Note

*All refrigerant circuit components that are open must be closed with proper plugs to prevent humidity from entering them.*



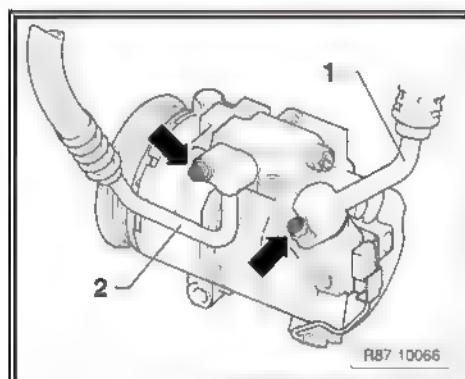
- Loose compressor fastening screws:
  - ◆ Engines 1.0L (BNX, CCNA) and 1.6L (BPA, CCRA, CFZA) [⇒ page 89](#)
  - ◆ Engines 1.0L (AQZ, BJE, BNX) and 1.6L (BAH, BJA, BPA) [⇒ page 91](#)
  - ◆ Engine 1.4L (BKR) [⇒ page 93](#)
  - ◆ Engine 1.2L (BMD) [⇒ page 95](#)
  - ◆ Engine 1.4L (BNM) [⇒ page 97](#)
- Remove the compressor.

#### 8.4.2 Installation

Installation is performed in reverse sequence to the removal, observing the following.

- Observe the fastening screw tightening sequence:
  - ◆ Engines 1.0L (BNX, CCNA) and 1.6L (BPA, CCRA, CFZA) [⇒ page 89](#)
  - ◆ Engines 1.0L (AQZ, BJE, BNX) and 1.6L (BAH, BJA, BPA) [⇒ page 91](#)
  - ◆ Engine 1.4L (BKR) [⇒ page 93](#)
  - ◆ Engine 1.2L (BMD) [⇒ page 95](#)
  - ◆ Engine 1.4L (BNM) [⇒ page 97](#)
- Remove the refrigerant hoses -1- and -2-.
- Screw on the fastening screws -arrows- with torque of (22 Nm).

If it is necessary to replace the compressor, refer to ⇒ Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .





### 8.4.3 Indications to install new compressor



#### WARNING

*Use different refrigerant gas oils and feeding quantity due to the type of compressor used.*

*For example, 70 cm<sup>3</sup> of refrigerant gas oil have been removed from the damaged compressor and 220 cm<sup>3</sup> from the replacement compressor (there is a small amount of refrigerant gas oil that remains in the compressor). In this case, fill the replacement compressor (which will be mounted), with 70 cm<sup>3</sup> of refrigerant gas oil (do not reuse the refrigerant gas oil contained in the damaged compressor).*

*After filling the cooling loop with gas, do not start the engine.*

- After installing a new compressor or filling with new refrigerant oil (for example, after purging the refrigerant circuit), turn Poly-V belt manually 10 times, before starting the engine. This prevents damages to the compressor.



#### Note

*Run the engine only with the refrigerant circuit closed.*

- Start the engine with the compressor turned off (Climatic in "ECON" operation mode) and wait until the speed regime of idling speed stabilizes..
- Open the instrument panel air baffles.
- In the air conditioning adjustment mechanism (Climatic), select the position "Low" on the temperature selector, which corresponds to the lowest temperature in the system.
- Turn on the compressor and keep it running for at least 5 minutes with the engine idling.



#### Note

- ◆ *Run the engine only with the refrigerant circuit closed in order not to damage the compressor.*
- ◆ *To prevent damages on the compressor, it is equipped with "internal oil loop". To enable this internal lubrication, the compressor must have a residual quantity of refrigerant lubricant, since when there is no gas in the system, the refrigerant lubricant is not carried to the compressor.*
- ◆ *The Adjustment valve for the air conditioner compressor - N280- is not activated when the refrigerant circuit is empty. The compressor will turn in vain, following the engine speed regime*
- ◆ *If a compressor is locked, the overload protection is released from the compressor shaft. This can be observed when deformations are detected on the Poly-V belt, which are not always noted, or by the presence of rubber dust on the Poly-V belt grooves.*

If the engine must be started with the cooling system without gas, observe the following items:

- ◆ The refrigerant circuit must be completely installed and closed.

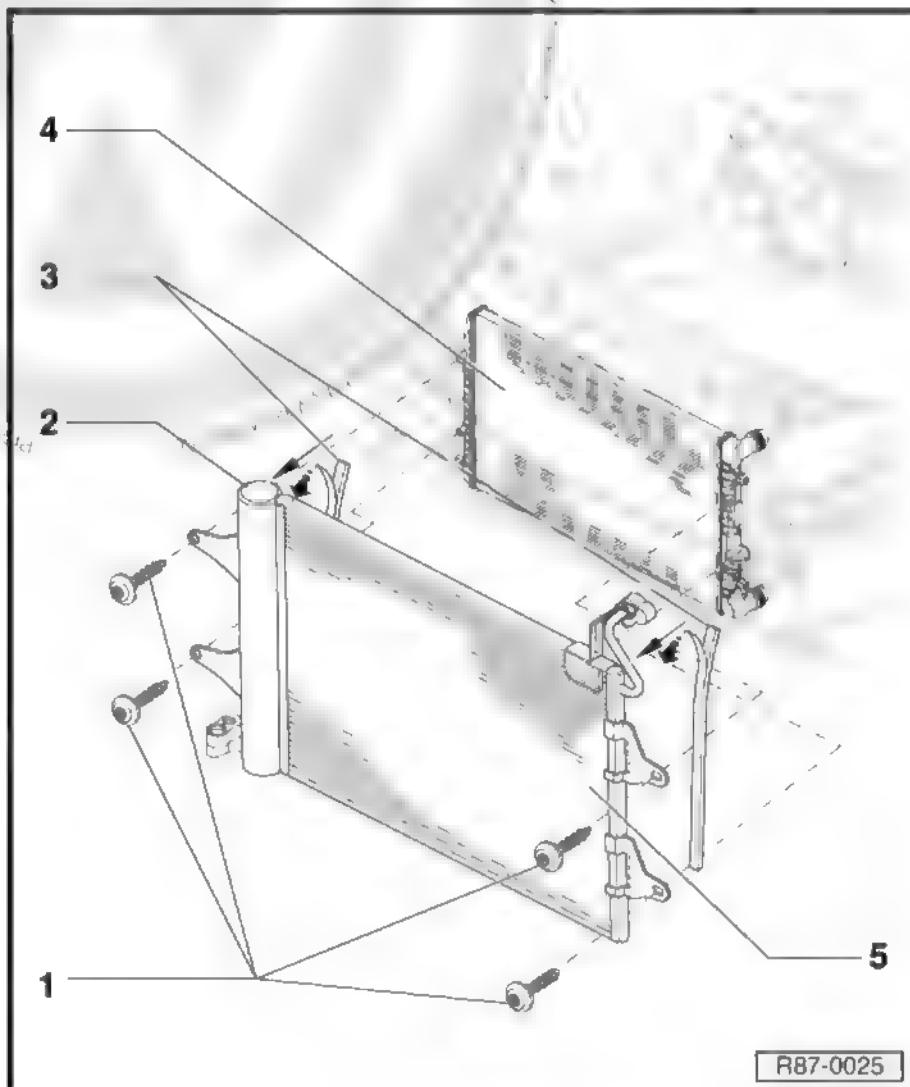


- ◆ The compressor must have at least one quarter of the oil level expected for the refrigerant.
- ◆ The engine speed must not exceed 2500 revolutions per minute.
- ◆ Run the engine only for the time strictly required.

## 8.5 Condenser - remove and install

### Assembly overview:

- 1 - Screws
  - 4 units
  - 5 Nm
- 2 - Dryer filter receiver
  - Remove and install  
[page 118](#)
- 3 - Sealing
  - Replace if damaged
- 4 - Radiator
- 5 - Condenser
  - With dryer filter receiver





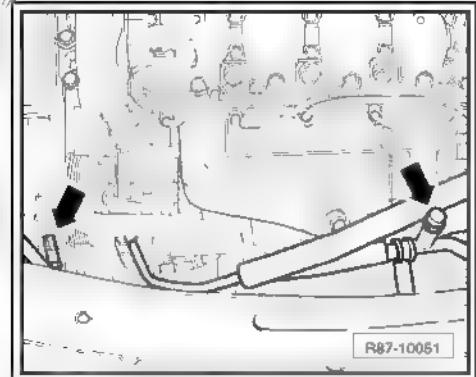
### 8.5.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas  
⇒ Air conditioning with R134a refrigerant, Rep. gr. 00 ; Technical data .



#### Note

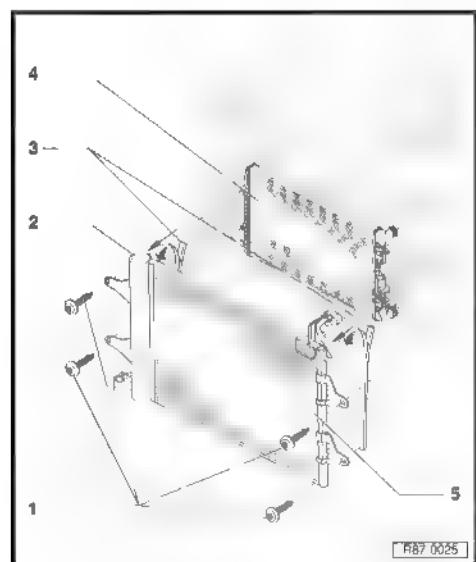
- ◆ *Contaminating the environment with refrigerant is a punishable offence.*
- ◆ *All refrigerant circuit components that are open must be closed with proper plugs to prevent humidity from entering them.*
- Remove front bumper ⇒ Body - External assembly work; Rep. gr. 63 ; Bumpers .
- Remove front end ⇒ Body - External assembly works; Rep. gr. 50 ; Body - Front part .
- Loosen radiator fastening and remove it from front end.
- Release and close the refrigerant hoses along with the condenser.
- Remove condenser fastening screws.
- Remove condenser.



### 8.5.2 Installation

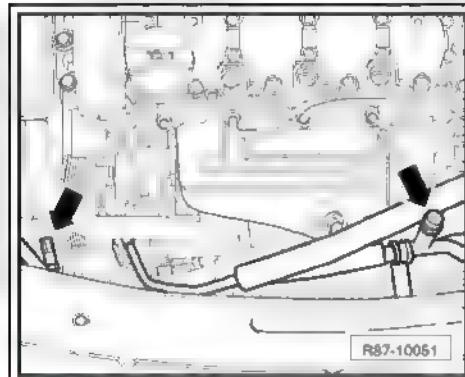
Installation is performed in reverse sequence to the removal, observing the following:

- Tighten fastening screws -1- to (5 Nm) torque.





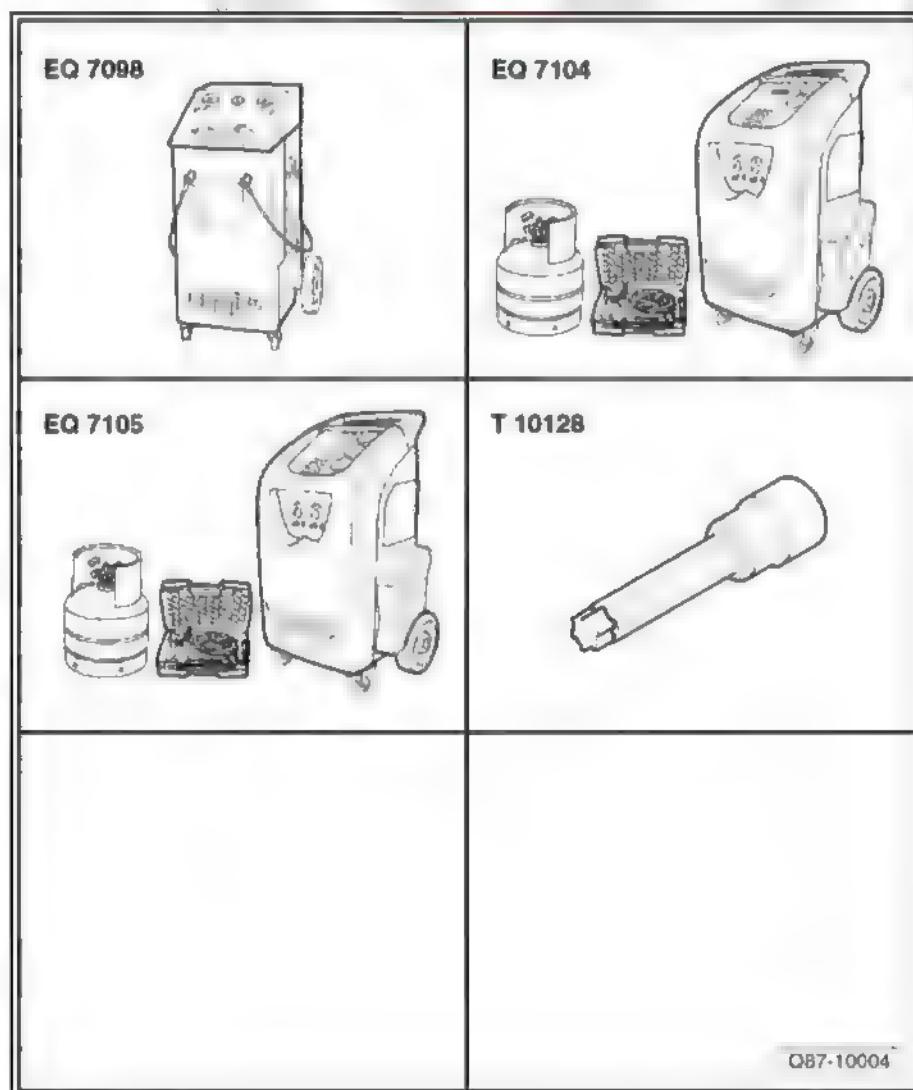
- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas → Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .
- Check the amount of gas supplied → [page 126](#) .



## 8.6 Dryer filter - remove and install

### Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refill and cleaning set -EQ 7105-
- ◆ T70 socket -T 10128- or Torx TX55 socket





The equipment has a quick release coupling adapter for service connections on both the high and low pressure sides.



**Note**

- ◆ First extract the refrigerant gas with the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment ⇒ Air conditioning with R134a refrigerant gas; Rep. gr. 00 ; Technical data
- ◆ Environmental contamination by the refrigerant is a punishable offence.
- ◆ All cooling gas loop components that are open must be closed with proper plugs to prevent humidity from entering the components.

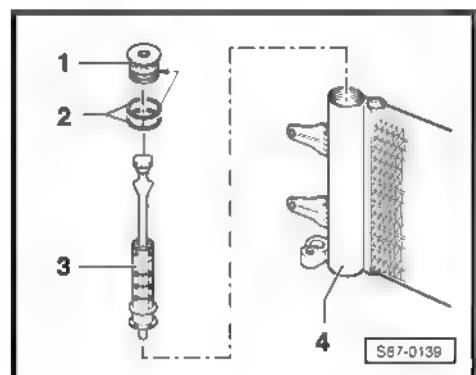
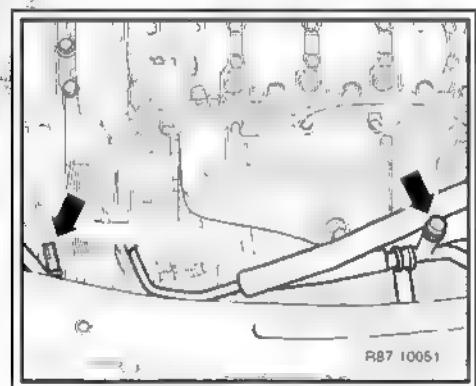
### 8.6.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas ⇒ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .



**Note**

- ◆ Contaminating the environment with refrigerant is a punishable offence.
- ◆ All refrigerant circuit components that are open must be closed with proper plugs to prevent humidity from entering them.
- Remove the front bumper protector ⇒ Body - External assembly works; Rep. gr. 63 ; Bumpers .
- Remove front end ⇒ Body - External assembly works; Rep. gr. 50 ; Body - Front part .
- Remove the sealing plug -1- with the Torx socket TX55 or the T70 Socket -T10128- .
- Remove the filtering element -3- from the dryer filter receiver -4-.



### 8.6.2 Installation

- Replace sealing rings -2-.

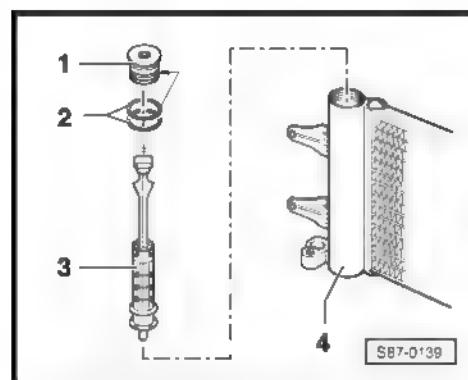


- Install filter -3- to the dryer stop -4-.
- Install new sealing rings -2-, lubricating them with cooling gas oil in the sealing screw -1-.
- Install sealing screw -1-, tightening it to 15-Nm torque.
- Install front end ⇒ Body - External assembly works, Rep. gr. 50 ; Body - Front part .
- Install front bumper protector ⇒ Body - External assembly work, Rep. gr. 63 ; Bumpers .

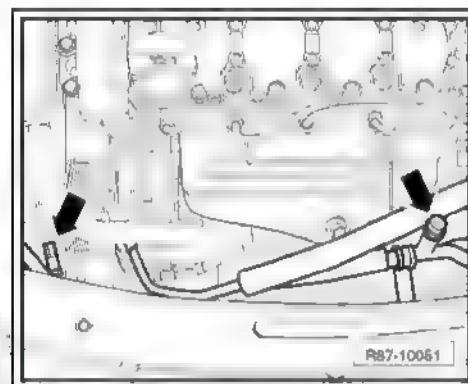


Note

*The purpose of the dryer filter is to accumulate drops of fluid and to send them to the expansion valve, in an uninterrupted flow. Humidity that penetrates into the cooling loop during assembly is absorbed by the dryer filter.*



- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ⇒ Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .
- Check the amount of gas supplied. ~~page 126~~



## 8.7 Expansion valve - remove and install



**1 - Evaporator case/engine compartment partition panel sealing**

- Observe the installation position [⇒ page 64](#).
- Observe the installation position (Europe vehicles only) [⇒ page 65](#).
- Replace if damaged

**2 - Sealing ring**

- Replace
- 11.10 mm; 1.78 mm

**3 - Expansion valve**

- Remove and install [⇒ page 121](#).

**4 - Sealing ring**

- change
- 10.8 mm; 1.82 mm

**5 - Refrigerant hose**

- High pressure
- From dryer filter to expansion valve

**6 - Refrigerant hose**

- From expansion valve to compressor

**7 - Screw**

- 5 Nm

**8 - Screws**

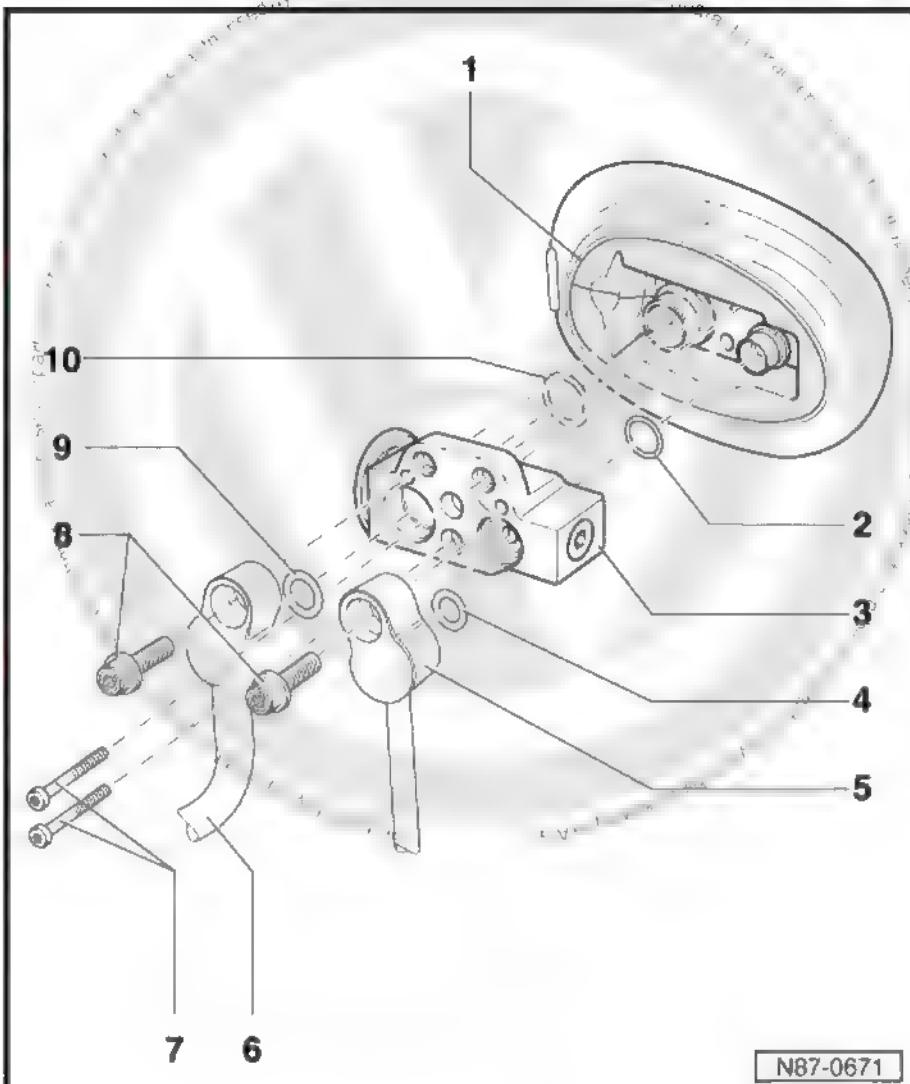
- 2 units
- 10 Nm

**9 - Sealing ring**

- 14.30 mm; 2.40 mm

**10 - Sealing ring**

- 0.68 in; 1.78 mm



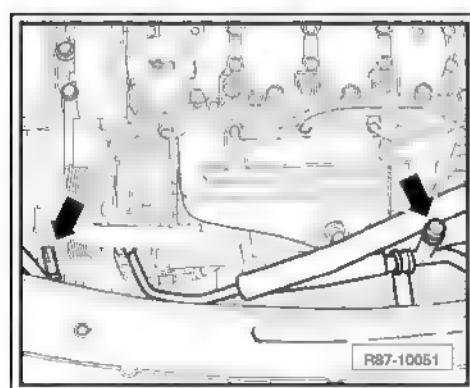
### 8.7.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas  
⇒ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .



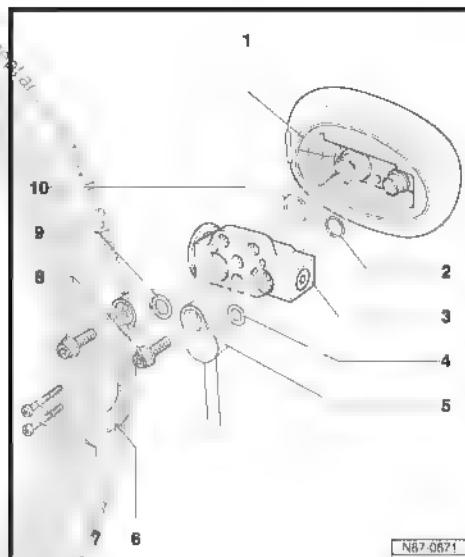
**Note**

- ◆ Environmental contamination by the refrigerant is a punishable offence.
- ◆ All refrigerant circuit components that are open must be closed with proper plugs to prevent humidity from entering them.





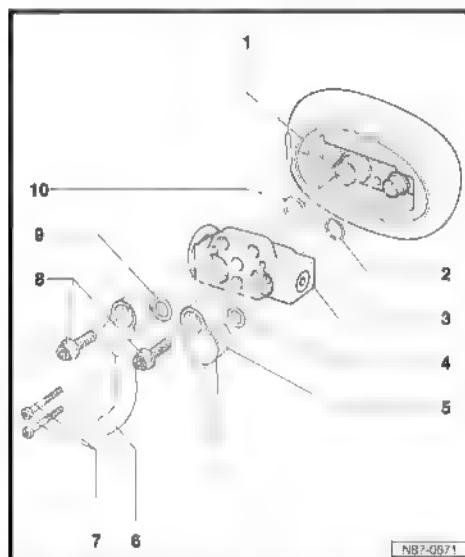
- Remove the screws -8-.
- Remove cooling gas hoses -5 and 6-.
- Remove the screws -7-.
- Remove the expansion valve -3-.



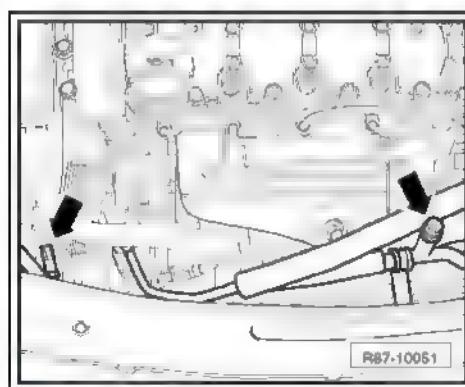
### 8.7.2 Installation

Installation is performed in reverse sequence to the removal, observing the following:

- Replace the sealing rings -2, 4, 9 and 10-.
- Tighten screws -7- with 5-Nm torque.
- Tighten screws -8- with 12-Nm torque.



- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas  $\Rightarrow$  Air conditioning with R134a cooling gas; Rep. gr. 00 ; Technical data .
- Check the amount of gas supplied  $\Rightarrow$  page 126 .

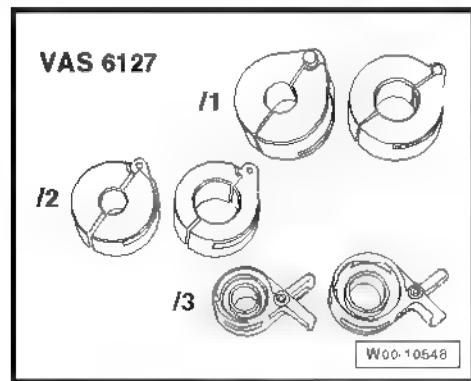


### 8.8 Quick-release coupling - remove and install

Special tools and workshop equipment required



◆ Disconnector -VAS 6127-



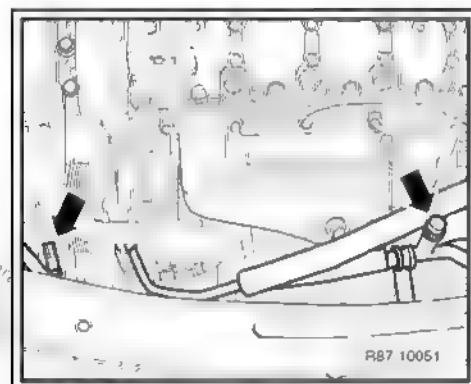
- ◆ Disconnector -VAS 5231-
- ◆ Disconnector -VAS 5231/1-
- ◆ Goggles
- ◆ Sleeves

### 8.8.1 Quick-release coupling removal

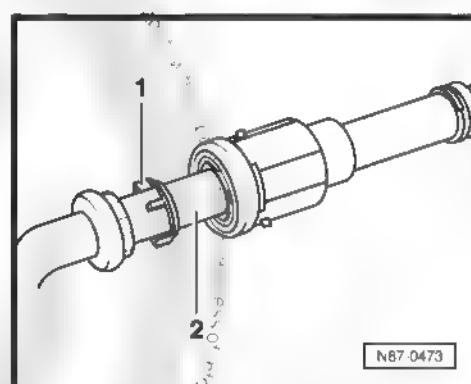


*After every removal, the sealing ring, locking insert and safety ring must be replaced.*

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- in the refrigerant circuit and aspirate all the gas  
⇒ Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .

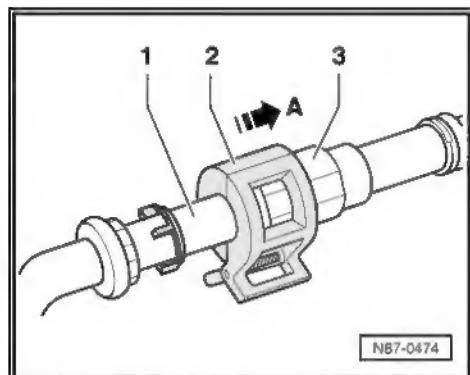


- Displace the sealing bellows -1- from the coupling of the refrigerant pipes -2-, so that the assembly area is freed from the coupling.

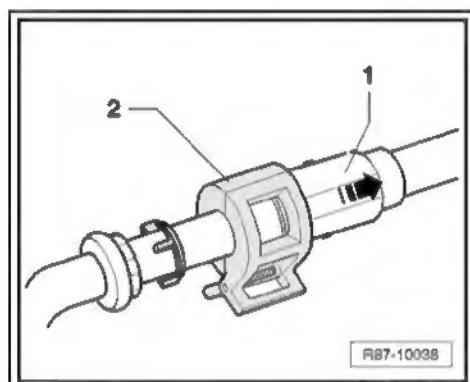




- Place disconnector -2- in the coupling segment. The cuts on the tool must be in line with the indicators.
- Push disconnector -2- in the direction of -arrow A- into compressor pipes -1- against the stop of coupling -3-.

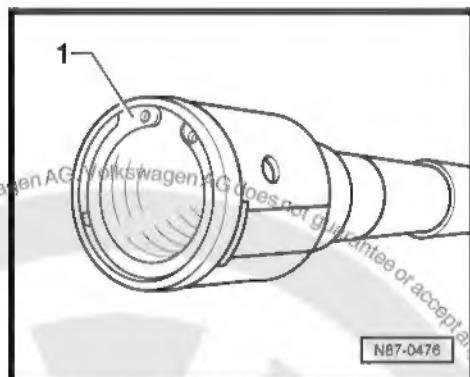


- Hold disconnector -2- on the stop and pull coupling -1- in the direction of -arrow-.
- After every removal, the sealing ring, locking insert and safety ring must be replaced.

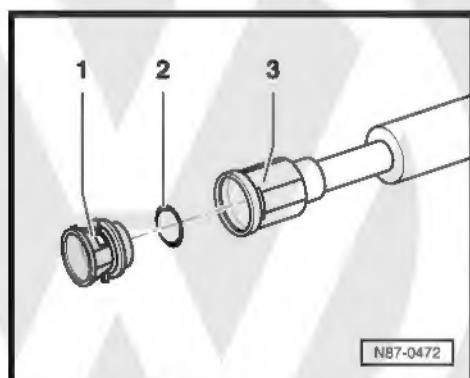


### 8.8.2 Removing the quick-release coupling components

- Remove the disconnector and remove lock -1- from the coupling using suitable pliers.



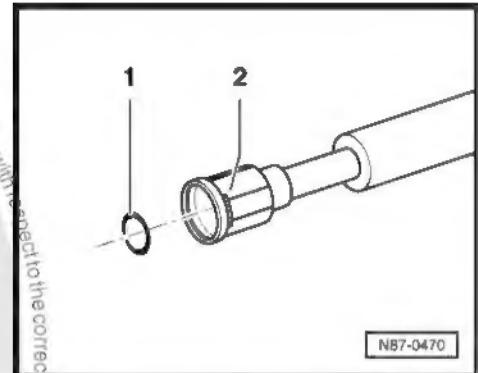
- Remove locking insert -1- and the sealing ring -2- from the coupling -3-.





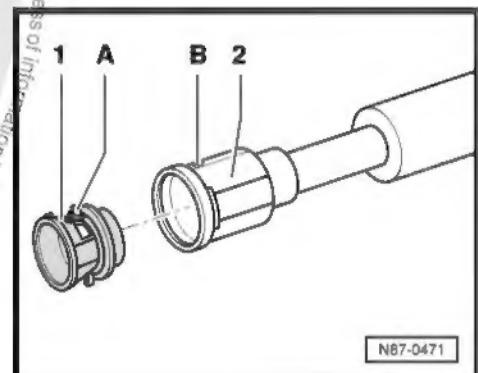
### 8.8.3 Installing the quick-release coupling components

- Dampen the sealing ring -1- with refrigerant oil and insert the sealing ring in the coupling -2- up to the stop.



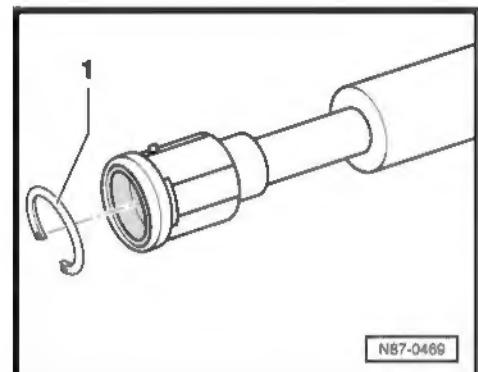
NB7-0470

- Insert the locking element -1- into the coupling -2-. The indicators -A- must be positioned so that they coincide with the holes -B- in the coupling.



NB7-0471

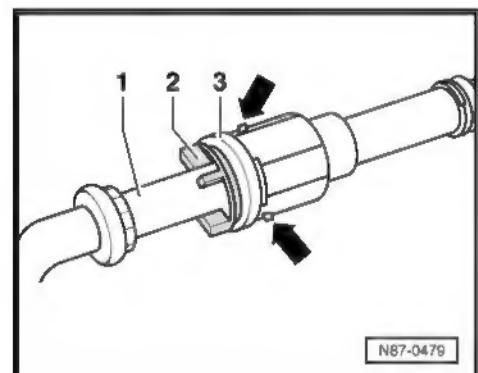
- Install the lock -1- with proper pliers.



NB7-0469

### 8.8.4 Quick-release coupling installation

- Introduce the coupling area compressor tubing -1- into the coupling -3- of the cooling gas tubing until the indicators come out clearly through the holes -arrows-.
- Move the sealing bellows -2- to the coupling -3- so that the sealing bellows adjusts to the coupling.



NB7-0479



## 9 Filling capacities

### 9.1 R134a refrigerant gas

Compressor	Manufacturer	Filling capacity
CVC	Delphi	450 ± 25 grams

### 9.2 Refrigerant gas R134a (Europe vehicles only)

Compressor	Manufacturer	Amount to be filled (vehicles until 07/13/2008)	Amount to be filled (vehicles as from 07/14/2008)
CVC	Denso	550 ± 25 grams	500 ± 15 grams

### 9.3 Cooling system oil

A special oil must be used exclusively for R134a refrigerant circuits, and that should not be purchased in stores that sell oil for machines with refrigerant.

The cooling system oil can be purchased under replacement part number			
Manufacturer		Number for replacement oil	
CVC compressor	Delphi	5Z0 820 803 5U0 820 803	G 052 154 A2
	Denso	6Q0 820 803 (J / K / Q) 6Q0 820 808 (A / B / C / D / E / F)	G 052 300 A2

Type	Filling capacity <sup>1)</sup>		
CVC compressor	Delphi	5Z0 820 803 5U0 820 803	59.06 in <sup>3</sup>
	Denso	6Q0 820 803 (J / K / Q) 6Q0 820 808 (A / B / C / D / E / F)	80 cm <sup>3</sup>

1) This quantity of cooling system oil is contained in the replacement compressor and corresponds to the total filling capacity.

#### Important information:

Since the cooling system oil is highly hygroscopic, the opened containers must be closed immediately after use, protecting the containers from moisture.

Because of its chemical properties, the cooling system oil must not be discharged along with engine oil or gear oil.

#### 9.3.1 Oil distribution

The oil in the compressor oil sump, before the air conditioning is turned on for the first time, is distributed through the refrigerant circuit at the following rates:

- ♦ Compressor (approx. 30%)
- ♦ Condenser / Dryer filter (approx. 30%)



- ◆ Flexible intake tube (approx. 10%)
- ◆ Evaporator (approx. 30%)



Note

*When replacing the compressor, slowly remove the replacement compressor plugs so that the gas used for pressurizing is released. This prevents compressor oil loss.*

When replacing the loop components, correct the quantity of refrigerant oil. Check additional recommendations, related to:

- ◆ Replacing the compressor => Air conditioning with R134a refrigerant; Rep. gr. 00 ; Technical data .
- ◆ Liquid receiver replacement => Air conditioning with refrigerant R134a; Rep. gr. 00 ; Technical data .
- ◆ Replacement of other components => Air conditioning with refrigerant R134a; Rep. gr. 00 ; Technical data .

In case of doubts about the quantity of cooling gas oil in the respective circuit, clean it, and then replenish with the recommended quantity of cooling gas oil => Air conditioning with R134a cooling gas; Rep. gr. 00 ; Cleaning the cooling gas circuit .

09.11

